MARCH 23, 1935

THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2.
Telegrams: LANCET, RAND, LONDON. Telephone: TEMPLE BAR 7228 and 7229

No. XII. OF VOL. I., 1935. LONDON, SATURDAY, MARCH 23, 1935. Pp. 128—Price 1s.
No. 5821. VOL. CCXXVIII. Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription: Inland £2 2s. Abroad £2 10s.

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No. 5821 LONDON, SATURDAY, MARCH 23, 1935 CCXXVIII

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EMERITUS PROFESSOR OF MENTAL DISEASES, UNIVERSITY OF LEEDS; FELLOW OF UNIVERSITY COLLEGE, LONDON

The important properties of living matter—one might rightly describe them as urges—are tenacity of life, tendency to growth, and capacity of unlimited reproduction. Further, living matter possesses an apparently limitless capability of change under alterations of environment, and this change is invariably associated, as complexity of structure increases, with a relative delicacy and beauty of appearance. Beauty, in fact, throughout vies with utility in all the details of the structure of living things. The final quality of living matter to which I need refer is the permanence of structures which have once evolved under the last two urges in spite of their still unlimited capability of variation under changes of environment. This is shown by the readiness with which variations occur and their relatively temporary nature unless their permanence has been established by the continuation during time in a geological sense of the causes which have produced them. The necessary consequences of what one can describe as the experimental method of evolution are an inconceivable waste of living units and the existence of multitudinous evolutionary failures and misfits. Living arthropods and extinct reptiles afford striking examples of the extent of this evolutionary urge and failure.

The primary urges of living matter can so readily be illustrated from the vegetable kingdom that specific examples here are unnecessary. Numerous ingenious details of structure which simplify the fertilisation of plants and make for their continuity are common, and also others which have gradually evolved under the influence of insect life and make for the same end may be instanced. These merely indicate the survival of the fittest methods and a normal reaction to permanently changed environment.

The Dawn of Mind

Premonitory signs of mind, in the sense of purpose, belong to a different category. Purposeful action, by which I mean movement with a purpose in contradistinction to conscious or purposive movement, is common. Certain flowers turn to the sun, or close their petals at night. Venus's flytrap (*Dionæa muscipula*) closes its spiked leaves and grasps any insects touching them. Such are actually needed for the diet of the plant since it fades when enclosed in a framework of gauze but remains healthy if morsels of meat are placed on its leaves. The well-known water plant *Vallisneria spiralis* is fertilised in a remarkably purposeful manner. The female flowers possess long spiral pedicles which enable them to lie on the surface of water of varying depth. The male flowers are chained at the bottom, but when they are ripe their pedicles break, enabling the flowers to rise to the surface. After fecundation, the female flowers sink below the surface of the water for the ripening of the fruit.

The absence of the power of locomotion doubtless constituted a permanent handicap to the evolution of purposeful activity in the vegetable kingdom, and in spite of their elaborate and beautiful external appearance and multiplicity of form permanently prevented their further emergence.

The animal kingdom did not suffer from this handicap and in consequence served as the basis for the evolution of purposeful activity and eventually of mind.

Animals first developed in water, as a prime necessity for locomotion, but the types which remained there suffered an almost comparable handicap to that of the plants owing to the resistive nature of the medium in which they lived. Little need be said of these beyond the fact that the lower invertebrates have persisted more or less unaltered for hundreds of millions of years, that the aqueous crustacea suffer an even greater handicap than that of their relatives on land, and that the fishes, in spite of their great variety of structure, still remain the lowest form of vertebrates. The flying fish, owing to its large pectoral fins, is able under the influence of fear to emerge from the water and remain in the air for a short distance, and the salmon under the influence of fresh and running water emerges into the air and falls back again. This is a necessary reflex to enable it to pass up rocky streams, and not as has been said a spring out of the water to see where it is located. The habit is purely a method of swimming and is employed around the mouth of a river equally as it is where actual rapidly moving water and rocky river beds necessitate it. It is a purposeful action on a par with those common in the animal kingdom and acquires notice solely owing to its relative rarity in fishes.

Purposeful Activity in Arthropods

Of the land animals, certain of the arthropods afford a fruitful field for the illustration of the evolution of purposeful activity and for the exhibition of examples of evolutionary failure. Their rigid exoskeleton, whilst a handicap to their emergence, has served a useful purpose in preserving them from destruction, and they are consequently by far the most numerous and ancient of the animals, the insecta alone in numbers and variety in spite of their underlying constancy of structure exceeding greatly the whole of the rest of the animal world taken together.

The appendages of the exoskeleton, in their adaptability, complexity, and beauty, vie with anything to be found amongst living things, and the gross differences in many cases between the male, female, and neuter forms are greater than in any other form of life and provide outstanding examples of specialisation for rapid and exuberant reproduction.

The earliest fossil insects are devonian in period, probably some hundreds of millions of years ago, and running, leaping, and flying types of orthoptera are represented as forms of cockroach, cricket, and mayfly. In the succeeding and lengthy carboniferous period there are found huge dragon-flies, mayflies, a praying mantis, crickets, and numerous varieties of cockroach, and the hemiptera are seen as bugs, plant-lice, &c. In the succeeding jurassic period, the diptera in the form of true flies are found, and the spider as an example of a land-crustacean. Butterflies and moths followed much later with the appearance of flowers.

* The first of two Lumleian lectures delivered before the Royal College of Physicians of London on March 19th. Lecture II. will appear in a coming issue.

It is probable that the rigid segmented exoskeleton of the arthropods on land and sea was the main factor in their survival, whilst at the same time the periodic ekdyses necessary for growth probably paved the way to the metamorphosis of many insects and made for their survival.

The method of shedding the exoskeleton throughout the order is in its underlying details the same, subject to mechanical considerations. The lobster, possessing a carapace of shell in place of the wings of insects necessarily has to lie on its back and escape from the ventral aspect, withdrawing itself head first by jerking movements and leaving behind the shell, the coverings of the limbs and the chitinous and shelly lining of the stomach. The exoskeleton then hardens in a day or two. This is the usual under-water method, and in this connexion I would mention that the crustacea, as is clearly seen in the crab and the lobster, exhibit well the embryonic urge to complete growth by their capability to re-grow appendages which have been accidentally lost. It is quite common to find lobsters and crabs with great claws or chelæ of different size, the smaller bearing evidence of recent growth and not of delayed ekdysis.

The land method of ekdysis differs somewhat from that in water. The cockroach, which undergoes several annual ekdyses, splits longitudinally in the dorsal region, and withdraws its head and eyes, antennæ, fore, middle and hind legs, and eventually its abdomen. It rapidly hardens and darkens. The large grey grasshopper, which in the larval state resembles a wingless insect, undergoes a similar ekdysis whilst hanging by the hind legs. Suspended eventually by the tip of the abdomen, it then turns upwards, seizes the skin by its anterior claws, and hangs in this position for its wings gradually to unfold and harden. The escape takes place with the greatest ease, and its purposeful nature is not only obvious but is perhaps the most complicated and fascinating act performed by the creature. The dragon-fly larva climbs out of the water along a stalk, and after a similar escape the insect falls backwards and remains suspended by the tip of the abdomen whilst its weight gradually pulls it out to its full length. The insect then turns upwards to allow its wings to unfold. This is a most instructive modification of the last method described. The larva of the tree-grasshopper, cicada, after hatching, burrows underground and remains there no less than four years, growing larger each season. It then escapes from the ground and climbs a suitable stem or twig, after which the dorsal surface of the exoskeleton cleaves longitudinally and the creature emerges and within a few hours flies away, to live about a month as a noisy insect.

From this is a small step to the process of metamorphosis. The cockchafer or maybug (*Melolontha fullo*) buries its eggs some inches deep in a hole bored in the ground. After hatching the larva lives underground for four years, eventually growing to the size of a walnut, when it forms a burrow some feet below the surface, in which to assume the chrysalis form. Some months later the perfect insect emerges from the chrysalis but remains in its tenement for three or four months, gradually maturing for the time at which it burrows its way upwards, to emerge as a strong active flying insect. In other types, as the mayflies, a long larval stage is passed under water, and the perfect or final stage lasts a matter of hours only, merely in fact for the female to be fertilised and to lay her eggs. Such insects in their final stage of metamorphosis possess neither mouth nor digestive organs.

It seems impossible to explain such methods of development unless on the ground of prolonged survival of the race under, at times, disastrous climatic conditions.

The exoskeleton of insects exhibits an inconceivable variety of structure and complexity, where beauty vies with purposeful function, and where in many instances structure does not necessarily connote present function.

The combs of the spider and the proboscis and sting of the bee are outstanding examples of the former. The mandibles of the stag beetle which functioned actively for years as wood borers in the larva but are ornamental though capable of giving a nip in the developed insect, and the elaborate feathered antennæ of the banded monk moth (*Lasiocampa quercus*) which enable the male to find the female by smell whilst the similar antennæ of the clover moth do not possess a similar aptitude, are examples of the latter.

Purposeful activity often becomes futile under the slightest adverse conditions. The acorn beetle possesses a rostrum for drilling acorns of such a size and length that it is not uncommon for the insect when drilling, as if with a bradawl, to lose its foothold and to die suspended in the air on its unwieldy instrument (Fabre). If the entrance to a wasp's nest be closed with wool soaked in cyanide of potassium, all the returning wasps cling to the wool and die there. The banded monk moth is attracted from great distances by the female, but if she be removed from her seat or perch and placed under a bell-jar quite near to it, the moths go at once to the place where she was sitting and do not pay any attention to her. This blind futile reaction to stimulus is only equalled by the fact that certain moths—e.g., the peacock—live a few days only after all the elaborate ritual of growth and metamorphosis, possess abortive mouth and digestive system which are functionless, and apparently live solely for the purpose of fertilisation, as do the dayflies which live only a few hours.

Sex-specialisation exists to an extreme degree in many insects. The female termite, the so-called white ant, when ready to lay, is a swollen egg-bag some 2000 times her normal size and quite helpless. The female vapourer moth possesses abortive wings and hardly moves from where she lays her eggs. The male bee parasite, one of the Strepsiptera, is a very active insect with two posterior wings and a pair of twisted appendages in front in place of the anterior wings. The female is like a sack with a short neck. This neck, which consists of head and thorax, protrudes externally between two segments of the abdomen of the host bee, but the sack or abdomen of the parasite remains within the bee and merely presents an opening externally for impregnation and for escape of eggs.

Many insects live in colonies. The orthopterous termites, for example, build huge conical mounds. The colony consists of workers, soldiers, males and females. The workers outnumber the soldiers by about 100 to 1 but are many times smaller. The winged males and the females are somewhat larger than the soldiers. During a great hatching and massacre, a number of workers start a colony by collecting one male and one female and protecting and feeding them solely for the purpose of acquiring eggs, which the female is ripe to produce in two years.

Certain hymenoptera live similarly in colonies. The ordinary worker ants, for example, make complicated burrows below the surface of the ground. Their actions are so purposeful as to suggest to the observer a human colony and to produce a false suggestion of intelligent activity. In reality the worker ants are merely carrying out their specialised activity as pupæ protectors. Individuals separated from their colony are helpless.

Other hymenopterous insects, for example, bees and wasps, provide an interesting intermediate stage towards colony formation. Numerous varieties of bees and wasps are solitary and make their own burrows. They seal up their eggs with the necessary food in each cell, pollen in the case of bees and stung and stupefied caterpillars, &c., in that of wasps, and never see the results of their labours. They often live in groups, each attending solely to its own mechanical cycle of work. In the varieties which form true colonies, specialisation takes the form of predominance of the queen bee or wasp, who holds together the colony by her attraction instead of merely being the producer of ova, and suffers no rival. Separate cells are

provided for the pupæ and for food, and the supply of queen bees is kept up by the provision of suitable cells and food for impregnated eggs. The other units of the colony are neuters and drones. The drones are males and non-workers. They are developed from unfertilised eggs, and one alone of them is needed for a solitary fertilisation of the queen bee during her single flight for the purpose. The neuters are the worker bees and are abortive females which at times produce abortive eggs. They differ from the queen solely in the shape of the cell in which they grow and in the type of food given to them whilst in their pupal state.

It seems clear, therefore, that the urge to the evolution of mind through the arthropods resulted in the provision of highly elaborate instruments for purposeful action and of objects of great beauty. The exoskeleton in which they are clothed and which serves as their support, whilst it has made for their survival through hundreds of millions of years and by its ready adaptability to changed conditions and needs has enabled purposeful action to attain to a high level, nevertheless served as an insuperable handicap to the arthropods in the race for progress. Further, their very exoskeleton which kept them alive has perpetuated countless anatomical characters after their purpose had been served or failed, and has thus provided a living museum of curiosities and might-have-beens.

Lower Vertebrates

It remained to the vertebrata, after many futile efforts, to succeed, where the invertebrata had failed, in providing a suitable medium for the evolution of purposeful activity into mind, and finally into voluntary thought and individually acquired purposive activity.

It is unnecessary to refer at any length to the lower orders of vertebrates, the fishes, the amphibia, and the reptilia. The first two never became serious competitors, but the reptiles, from the permian to the Cretaceous period, during some one hundred and fifty millions of years, flooded the land and neighbouring seas with more and more enormous, elaborately ornamented, fearsome, and grotesque forms of life, which geological upheavals and consequent changing climatic conditions fortunately ended relatively abruptly.

The reptilia afford a number of unique examples of evolutionary futility. The pterosauria, with their wings supported by an enormous four-jointed ulnar finger, were foul and dreadful caricatures of birds. The scaly struthiomimus, from the purely skeletal aspect, could be mistaken for an ostrich with a tail and with short arms in place of wings. These reptilia are examples of over-specialisation in orders which did not provide a suitable predecessor, or pro-avis, for bird life.

The dinosaurs presented enormous and fearsome caricatures of mammals, their skeletons being distinguishable mainly by the possession of a compound lower jaw in place of the mammalian mandible and ear ossicles. Many—e.g., the stegosaurus—developed elaborate scaly and bony excrescences reminiscent of those of the exoskeleton of arthropods.

The reptilia, though a mass of evolutionary failures and misfits, eventually succeeded in producing a further evolutionary failure in the progenitor of the class aves, and a success in that of the class mammalia.

When I employ the term "evolutionary failure," I of course mean failure as a suitable medium for the evolution of mind. It is logical to regard all manifestations of life as results of the life urge to growth and specialisation, and to consider the special urge towards the evolution of mind in a suitable physical medium merely as a more productive evolutionary force than that which spent itself in structional forms unfit to survive or evolve further. In nature the purposeful action of a flower and the highest effort of the human intellect differ infinitesimally in degree.

Purposeful Activity in Birds

Even as early as the trias, when the great reptiles held sway amongst living things, the first evidence of birds was found in the form of the archæopteryx. The remains were discovered in the lithographic slate of Solenhöfen, in Bavaria. The creature was feathered and long-tailed, and about the size of a pigeon. Its reptilian origin was shown by the possession of teeth and by non-ankylosis of the metacarpals.

The new variety of living thing possessed feathers in place of the scales of reptiles and the chitinous or shelly envelope of the arthropods. Birds were still very reptilian in structure during the cretaceous period which saw the last of the great reptiles; and during the fifty millions or so of years since that time, whilst they have evolved and wonderfully elaborated the external avian characters, they have shown little structural modification. For the purpose of flying they acquired by bony fusion a rigid endoskeleton, and lost the use of their fore-limbs for other functions than progression through the air with the assistance of the feathers attached to them. It is likely that their power of flight made for their survival when the great reptiles as a whole succumbed to climatic conditions, but the wings which increased their capacity for locomotion nevertheless, with their rigid endoskeleton, served as an insuperable obstacle to their further progress as factors in the evolution of mind.

The bird-mentality is worthy, however, of more than a passing notice.

The first act of the chick is a highly purposeful one which is not dissimilar in some respects from the ekdysis of the arthropods. The chick lies in the shell with the head curled to the right and lying upside down under the right wing and above the right foot. The point of the beak, which is covered by a horny scale (the shell-breaker of the reptilia), lies adjacent to the anterior surface of the right knee at the point of trisection of the egg at the larger end where the air-space is situated. The chick lies within, but not anywhere adherent to, a smooth vascular membrane, and is as free in it as is a lung in a pleural cavity. When the chick has fully grown under suitable conditions of temperature and moisture, and the necessary degree of drying of the egg-contents has occurred, the chick commences to make extension movements of the body and lower limbs, which by straightening the vertebral column press the horny scale on the beak against the shell. Eventually a depression results with a "pip" on the outside of the shell. This serves as a fixation-point, and the body of the chick, when the effort relaxes, lies slightly to the left of its previous position. The next stretching effort of the chick fixes the new position by pressure of the knee, and enables the vertebral column to straighten forwards and the beak to "pip" the shell to the left of the previous "pip." The same result follows, and effort by effort slips the chick gradually round from right to left until the circle is completed. The upper cap then comes off, and the chick, after a rest, escapes in the order of head, neck, and wings, lower limbs, abdomen, and tail, the yolk-sac, which is already practically intra-abdominal, following last. The chick rapidly sits up and dries and walks unsteadily almost at once. Occasionally the chick lies curled to the left, when the movement is from left to right with otherwise normal hatching. Anything which prevents rotation of the chick—e.g., adhesions to shell from ill-advised interference causing local bleeding, the chick lying upside-

down and trying without room to penetrate the smaller end of the egg, an over-dry atmosphere with adhesion of the beak to the point of pressure, protrusion of the point of the beak through the shell, &c., will result in death in shell.

After two days the chick is strong and ready for food. It picks up and swallows any attractive object, not necessarily of an edible nature. By the time it is three or four days old it performs quite perfectly the complex act of scratching for food. This is done even if there is no object to be attained by it and in the absence of a hen.

The mother hen, when bringing up chicks, attracts them to food by a note which is common to all hens. She often picks up and offers to baby chicks most unsuitable articles both in size and character. She may tread on and kill chicks without knowing it if they are so placed as to be unable to chirp. She often makes no effort at all to get baby chicks under her, but may sit down and brood with dying chicks lying around her, without noticing them.

The activities of fowls are remarkably stereotyped, so much so that the slight individual differences, even between different kinds of fowl, are overshadowed by the underlying similarity. In a colony they have the same habits. They come for food when it is brought, or do the same when the visitor is obviously carrying nothing. They can be managed but are incapable of being taught, merely exhibiting varying degrees of tameness. It takes time to accustom them to unusual food and housing, and even to find the water-trough when a new shape is put in a different place.

The general behaviour of birds is stereotyped to the particular sub-class and needs no learning. Domestic cocks call their hens by the same note and offer any article which presents itself as food. Male pigeons court the females in the same artistic manner and tone whatever the variety. In spite of the readiness with which they may be tamed and of their attractive behaviour, a pair of pigeons, when starting a new family, will ruthlessly turn out the pair they were just before assiduously feeding, and, as I have noticed, if the construction of the house be such that the young birds cannot escape, the parents will go so far as actually to kill them. In other words, the breeding cycle is a stereotyped one which must not be interrupted even by the presence of the latest young. Few would deny that two of our most attractive birds are the robin and the blue tit. I have kept both in captivity in an aviary large enough for suitable observation. Except during the breeding season two robins, male or female, will not live together. They fight to the death, and in one instance a bird killed eleven others before he himself succumbed. This agrees with the common observation that robins in the wild state possess a beat of their own into which no intruding robins are admitted. The beautiful blue tit in captivity is a dreadful little carnivore. He kills, and eats the brains of, every bird not able to protect itself.

This stereotypism and unlearned automatism with little variation pervades the whole bird race, although at times marvellous skill is exhibited. Even such imitative birds as the parrot, which by using the beak and the individual feet like three limbs caricature the four limbs of mammals, nevertheless show no more mind than other birds. Some readily imitate sounds and words, and by an accidentally apposite word or phrase may simulate an intelligence which does not exist. The nesting arrangements of many birds are both unique and ingenious, but may readily be rivalled by those of certain arthropods which possess more delicate and complicated instruments for work.

In one respect however the bird class is noteworthy. The appendages of the arthropod exoskeleton are ingenious, delicate, complicated, and often wonderful. The wings of certain insects, and particularly of butterflies and moths, vie in beauty with the best even the world of flowers can show. The plumage of birds, however, in sheer beauty, delicacy, and variety, eclipses the external features of the lower forms of life at their best. Birds owe this predominance to the nature of their skin appendages, as feathers lend themselves remarkably for purposes of ornamentation, and particularly so when grouped as they are in birds so as to give grace to every movement of the animal. In this respect the feathers of birds serve a purpose which the rigid decorative effects of the lower forms cannot accomplish. It is to the beauty of their plumage and the grace of their movements, rather than to a close observation of the stereotypism and automatism of their purposeful activity, that birds owe the much overrated opinion of their intelligence that has been expressed by many writers.

Birds, particularly birds of prey, exhibit at times highly elaborate reactions, but the source of these is to be found, not in the capability to learn new methods by individual experience, but in an extraordinarily high evolution of sensitivity of their organs of special sense. The powers of sight and smell possessed by some varieties of carnivorous birds are almost beyond belief, and the sense-capabilities of certain homing and migratory birds are comparable to those of bees and certain varieties of butterfly and moth.

I have remarked that birds in their relation to man exhibit degrees of tameness only, and not the signs of developing mind shown by mammals. This is seen during the employment for sport of such carnivorous birds as hawks and cormorants, which are merely useful as weapons of the chase, and not as valuable coöperators like sporting or sheep dogs, or horses.

Although the male bird as a whole exhibits the more elaborate plumage, in many types the female is the larger and also the more attractive. The sex of pigeons, guinea-fowls, geese, and other birds can often only be detected by a careful study of their behaviour to one another, since no visible structural sex characters are visible.

Such considerations and the study of birds as a whole render it doubtful whether much proof could be adduced of a primarily sexual origin for elaborate and graceful plumage. It seems much more probable to me that the urge of living matter on which I remarked at the beginning of this lecture spent itself in the arthropods in mechanical elaboration of the exoskeleton with beauty in innumerable examples as an end in itself, in reptiles in a remarkable variety of size, shape, external ornamentation, and physical capability, and, in birds where there existed the serious handicap of a rigid endoskelpton and only two useful limbs apart from the beak, this same urge, failing the further possibility of purposeful physical evolution, expended itself in the elaboration of the feathery appendages into marvellous and intricate plumage with beauty and grace as the chief or only ends.

The bird class thus affords another and still higher example of the urge possessed by living matter in the direction of purposeful activity. Their behaviour is, however, unlearned, automatic, and stereotyped to their class and they owe their variety of superficial

form and habits and the permanence of these to their very long ancestry under varying climatic conditions.

At the same time the ready reaction to environment, which is one of the properties of living matter, is exhibited, as in the case of the more lowly flowers, by the readiness with which their appearance may be altered in a few generations by careful selective breeding—e.g., the innumerable modifications produced in flowers, fowls, pigeons, &c.—as well as of course in the still more plastic mammals. These modifications, produced artificially, with more or less rapidity, revert to the ancestral types, as the environmental causes are neither so prolonged nor so gradual in action as were those which perpetuated the latter. A few years, or a hundred years, are as a moment in comparison with the millions of years during which earth conditions have gradually moulded the permanent types, and human efforts are feeble and ephemeral when compared with the progress of the evolution of living matter and of purposeful activity.

The Mammalian Mind

I now turn to the consideration of the mammals, and to the further evolution of the purposeful activity of the lower forms of life into the purposive or individually acquired activity of the sole order of vertebrates on whose brain is implanted the cerebrum, great brain or neopallium, whose appearance has made possible the development of purposive or individually acquired activity. This is mind, though still mind in embryo until the primates are reached.

The earliest mammals appeared some two hundreds of millions of years ago during the triassic period and before the great reptiles had attained to their maximum evolution. Their appearance was more or less coincident with that of the first reptilian birds. They remained small and little changed for very many millions of years until the coming of the eocene, when they began rapidly to increase in size and to differentiate. The differentiation of mammals produced varieties as diverse as those of the great reptiles. Certain herbivora during the eocene and the oligocene, the titanotheres of Osborn, evolved enormous and wonderful horns which are chiefly of interest owing to their steady evolution, their complexity, and their lack of utility. They are reminiscent of the exoskeletal growths of reptiles and of arthropods. On the other hand, the horse has steadily evolved from a three-toed animal the size of a hare during the eocene, by steady reduction of the toes, to one, and equally steady increase in the number of efficient grinding molars and in the size and delicacy of the skeleton, to the present useful, beautiful, and relatively intelligent animal.

The steady evolution of the horse through perhaps fifty millions of years is the best example available of the paramountcy of the urge to evolutionary growth in living matter and of the relative unimportance of varying environmental conditions. The latter, I am certain, merely modify the direction of the evolutionary process, advancing or checking its progress or diverting it along the various possible channels.

Allied to the steady evolution of the horse, but more complicated and therefore less definite, is the gradual evolution of the primates from the small tree-shrews (menotyphla) of the basal eocene, by a gradual increase in size and complexity, through the tarsioids, old world apes, anthropoids, and humanoids, to their present highest representative man or *Homo sapiens*. In this series the evolutionary or growth-urge, instead of being general, as in the lowest and also the fœtal forms of life, or in numerous special directions as in the various examples I have given, at last, on favourable soil, became concentrated in the great brain, and the body became moulded by it for skilled purposive intelligent activity in contrast to the instinctive unlearning machines of the past.

Some time during the many millions of years occupied by the eocene period, the proto-primates split into lemurs on the one hand and tarsioids on the other. From the latter branched the primate stem, and in the early oligocene the earliest old-world apes were found. More developed and definite anthropoid types occurred throughout the following miocene period. Before the close of the succeeding pliocene period at least three varieties of humanoid or early man existed so far apart as England, Java, and Peiping. The last, the sinanthropus of Davidson Black, knew the use of fire, made implements of stone, bone, and deer antlers, and lived in caves. This is certainly much more than a million years ago, and perhaps several, since the tertiary period (eocene to pliocene) is regarded by recent authorities as roughly occupying fifty millions of years.

During the succeeding million years of the pleistocene (ice age), and recent periods, man has evolved from this humanoid stage. Indications of this development, as shown by the distribution and character of the numerous flint implements discovered, together with other important indications of culture, quite definitely show that the process was very slow and was much modified by the four glacial, and the interglacial, subdivisions of the ice age, which caused extensive migrations and a mingling of cultures.

Neanderthal man, a clumsy but powerful variety, dominated the scene in Europe, Africa, and parts of Asia during the second part of the ice age for some two hundred thousand years, and disappeared with remarkable rapidity with the coming of the recent or post-glacial epoch, and the rise, not the advent, of *Homo sapiens*. During some hundreds of thousands of years homo sapiens had been gradually emerging, and with the passage of the last glacial period progressed rapidly in elementary civilisation, as is seen by his cave paintings, &c.

During the past twenty-five thousand years or so homo sapiens without a rival has rapidly improved in his culture, and civilisation as we understand it has now existed amongst the higher races for many thousands of years in Asia, Africa, and Europe.

As a wide-world event of paramount significance in the evolution of mind, this rapid evolution of the mammalia since the coming of the eocene is comparable to the rapid extinction of the great reptiles during the preceding cretaceous period. This may be associated with the remarkable world change in climatic conditions which during the eocene approximated more than ever before to those of recent times and were not seriously shaken even during the glacial epoch.

I turn now to the evolution of the mammalian mind. I have referred to the active part played by the arthropods during their ekdyses and to the exactly similar activity displayed by the metabolous insects during their metamorphosis. I have also described the allied activity of the chick during the process of hatching. None of these animals require maternal assistance either at these critical periods or afterwards.

In the mammalia, on the other hand, the developing fœtus lies curled in a muscular tube within the abdomen of the mother, and is nourished, except in the lowest groups, the ornithodelphia and the

didelphia, in close association with the maternal circulation through a placenta. Further, the mammalian fœtus takes no part in the act of birth but is expelled by the maternal musculature. Lastly, the young is suckled by the mother until fit for weaning. This close association between the developing embryo and the mother, followed by the suckling of the young, is undoubtedly responsible for the development of the maternal instinct, as distinct from the mere incident of the young as part of an hereditary sexual cycle of events.

Hair, as the mammalian epidermal appendage, whilst making less for beauty of form than the feathers, scales, and rigid ectoderm of lower types although in the lower mammals it still subserves this function, in association with horns in the herbivora, is essentially utilitarian rather than largely decorative in function, as also are the hoofs, claws, and teeth. Further, as the highest forms are reached the horny appendages and the hair dwindle, and in man remain solely as indications of ancestry. A similar remark applies to the teeth. The skeleton of mammals remains non-rigid and, whilst serving as support, still more subserves the important function of movement, automatic or skilled.

The limbs became specialised at their extremities to subserve the essential activities of the herbivora and the carnivora, and the quadrumana eventually appeared in association with tree-life. Binocular vision and hand-specialisation followed. The upright posture necessitated regression of the foot to an organ chiefly of locomotion and was associated with further specialisation of the hand. Lastly, with homo sapiens came increased flexibility of the vertebral column with cervical and lumbar curvatures, specialisation of the facial muscles, and the final evolution of the muscles of the larynx, tongue, and lips for the purpose of articulate speech. This was associated with an increase in the size of the thumb and a gradual modification of the general musculature for the purpose of highly skilled movements rather than for mere strength.

Connected with these physical changes, but always in advance of them, the new organ of mind, the cerebrum, gradually evolved in size and complexity. It would probably not be an exaggeration to say that the urge of living matter to which I have frequently referred became in the mammalia largely concentrated in the cerebrum, the purposive, personally employed activity of which implanted the needful changes on the existing musculature and the rest of the body.

This urge in the arthropods resulted in wonderful weapons for purposeful activity and the employment of these automatically. In the birds the limitations of their structure were such that the cerebrum did not evolve and their activities remained automatic, although purposeful activity by the employment of remarkably acute organs of special sense became wider in range. In the mammalia the plasticity of the skeletal and general body structures rendered possible the evolution of a neopallium and the moulding of the body activities up finally to the appearance of a mind with intelligent volition.

IT was announced at the "Lion" Hospital Aid Society's 36th annual festival dinner, held at the Dorchester Hotel, London, recently, that the society since its foundation has raised £150,000 for various hospitals and medical charities. The funds are derived from subscriptions and, to a lesser extent, from entertainments organised in aid of the society's work. Particulars may be had from Mr. I. Isaacs, 2, St. James's-place, E.C.3.

RESPIRATORY FAILURE

INCLUDING SO-CALLED ASPHYXIA NEONATORUM *

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III.—TREATMENT

IN the preceding lectures I was able to show that pioneer work on the ætiology and measurement of respiratory failure had been carried out within the history of this college by some of its distinguished fellows. But the history of resuscitation, or the treatment of the acute forms of respiratory failure, is usually taken to begin long before the college was founded; for the story of Elisha and the Shumanite's child illustrates vividly methods which are still in use to-day. The relevant passage [1] reads as follows:—

> "And he went up, and lay upon the child, and put his mouth upon his mouth, and his eyes upon his eyes, and his hands upon his hands; and he stretched himself upon the child; and the flesh of the child waxed warm."

Shortly afterwards the child sneezed several times and began to breathe normally. Here is to be seen the supply of warmth, the use of artificial respiration (i.e., movement of the arms), and the insufflation of carbon dioxide from expired air. The sneezing on recovery is also of interest in that it probably indicates a temporary incoördination in the respiratory centres and a similar phenomenon is often observed when new-born babies are being resuscitated. It is well, however, to stress the dangers of mouth-to-mouth breathing—now, in the days of easily available carbon dioxide, no longer necessary—for it is a comparatively easy matter to inflict serious damage, as in the fatal case reported by Emment.[2]

Actually the modern history of the treatment of respiratory failure begins with the introduction of the Schäfer method of artificial respiration at the beginning of this century. It is of some importance to fix the date of this, and in fact the method was first described in May, 1903, in a report of a special committee set up by the Royal Medical and Chirurgical Society of London to consider measures of restoring respiration.[3] In addition to this actual report, the subject was fully dealt with by Schäfer in a lecture to the Royal Society of Edinburgh in December of the same year [4] and also in the Harvey lectures in 1908.[5]

I now propose to discuss under three main headings (artificial respiration, inhalation therapy, and drugs) the methods available for the treatment of respiratory failure, dealing in a concluding section with the special problems in the new-born.

Artificial Respiration

Schäfer's method of performing artificial respiration is not only of historical importance, but illustrates the great value of the physiological approach to the problem. Probably for the first time all the then available methods were subjected to the severe test of measuring by a spirometer the actual amount of air which could be pumped in and out of the lungs at each breath, a test which clearly showed the

* The Goulstonian lectures for 1935 delivered before the Royal College of Physicians of London on March 7th, 12th, and 14th. Lectures I. and II. appeared in our last two issues.

ineffectiveness of many of the measures previously advocated. The prone position was also a new idea, arising quite simply from the fact that in any other position obstruction in the air-ways by mucus and the falling-back of the tongue cannot easily be avoided. Schäfer's contribution to this subject is a classical example of clear thinking and the practical application of physiological facts. Almost every year a new method of performing artificial respiration is described, and while the authors usually condemn all existing methods as "unsound" or even "brutal" (Jellinek [6]), it is not at all clear whether they have taken the trouble to read the detailed accounts of the experiments upon which the Schäfer method is based.

Artificial respiration is called for in two types of respiratory failure: (1) in the sudden cessation of breathing brought about by drowning, electric shock, suffocation by irritant or poisonous gases, or by oxygen deprivation; and (2) in those various conditions in which muscular paralysis, acute or chronic, affects the mechanism of breathing. For the former group Schäfer's method is clearly indicated, while for the latter some form of mechanical apparatus is to be preferred because treatment is prolonged.

Where acute apnœa occurs speed is essential and no time should be lost in applying the Schäfer method. It is extremely regrettable that so few members of the medical profession have received any training in how to perform the necessary movements with speed and accuracy. Boy-scouts, ambulance workers, and members of the police force are usually much better equipped to perform artificial respiration than doctors, and Henderson [7] goes so far as to say that lives have not infrequently been lost by physicians interfering with lay people who have been carrying out emergency measures in a thoroughly efficient manner. It should be a definite part of every physiology course to repeat Schäfer's work, and in learning the details of this method students would also, by measuring the tidal air, clearly realise its advantages over any other measure. I am glad to say that in at least one physiological department (under Prof. Samson Wright at the Middlesex Hospital) this is now a regular procedure. One reason for the present state of affairs is that almost the only occasion during their training when students see artificial respiration applied to adults is when a patient stops breathing on the operating table. Here the prone position, on the floor, is seldom if ever possible, so that the student sees less effective methods employed and these come to mind when later the doctor has to resuscitate a patient with acute apnœa.

No apparatus can replace the use of Schäfer's method in an emergency, although it is sometimes possible to begin with manual methods, so to speak, and continue by means of some mechanical measure. Positive-pressure inhalatory methods involving the use of a mask and pump are unsafe in most instances and quite unsuitable. For securing inhalation of oxygen and carbon dioxide masks may be of great value, but for the present the problem is the patient who has ceased to breathe. Intubation and rhythmical insufflation into the trachea is an ideal method in theory, and in skilled hands may be valuable in practice, as, for example, in certain types of respiratory failure in the new-born. The form of resuscitation apparatus which is most widely used, however, is an air-tight tank into which the patient is placed with the head outside. Alternative negative and positive pressures (or in some instances, negative pressure followed by a return to normal pressure) are obtained in the tank by means of electrical pumps and the effect is to produce movements of the chest wall and those of inspiration and expiration closely corresponding to normal. Thunberg [8] (of Lund) claims to have described such an apparatus under the term "barospirator" in the Swedish literature in 1924, but it is the name of Drinker which has become attached to the type of machine in common use to-day. The first description of the Drinker apparatus I can find [9] was in 1929 when it was used for a child of 8 years suffering with paralysis of the muscles of respiration due to poliomyelitis. Since that time there have been various contributors to the subject and modifications of the apparatus for special purposes. For example, Murphy and others [10] have described a type of Drinker apparatus for resuscitation of new-born infants which will be mentioned later. The main objection to the method in principle is the complicated and costly machinery involved and the necessity for having a specially trained team of workers available to make use of it. In contrast to this Eve [11] has described a simple rocking method in which he seeks to move the diaphragm by employing the forces of gravity. Forsyth [12] has applied this method with success in a new-born infant with respiratory failure. Finally, mention may be made of the apparatus described by Kerridge [13] and successfully used for a very long period of time in a patient with paralytic failure of respiration. This was in principle a method of positive pressure on the chest wall (by means of a rubber bag) in contrast to the Drinker method where more stress is laid on the negative pressure.

This briefly summarises examples of the best apparatus for resuscitation. In this mechanical age it is not surprising that there are many more machines and methods available than the three here mentioned, but their efficiency and physiological probity are open to question. No apparatus, however excellent, is any substitute for two resuscitation measures in acute cessation of breathing, which must be emphasised again at the risk of tedium: the air-ways must be cleared of obstruction, and artificial respiration by the Schäfer method must be employed at once.

Inhalation Therapy

The treatment of respiratory failure by the use of inhalation gases resolves itself largely into the use of oxygen with or without carbon dioxide. It may be pointed out, in passing, that the old-fashioned smelling-bottle represented, as Bramwell [14] has pointed out, a method of stimulating respiration which is no more crude than the application of cold or of a pain stimulus to the skin of the new-born. Before summarising the indications for the special use of gases in respiratory failure, I would like to make a few brief remarks about the air of the sick room.

It is generally agreed that any febrile patient should be in an atmosphere of fresh, moving air, without draughts, at a temperature of 60°–65° F. Not sufficient stress is laid, however, on the humidity of the air of a sick room, and it is desirable that this should not be allowed to become either too low or too high. In ordinary circumstances the usual risk is that the air will become too dry and with the increased respiratory rate brought about by fever a great deal of water is unnecessarily lost by the body in the expired air. In the new-born in particular this danger of hot, dry air is important, and measures should be taken to keep the air of every sick room from

getting too dry. The other extreme of making the air too moist is sometimes seen in relation to the "steam tent" which may be regarded as one type of inhalation therapy for certain forms of respiratory failure. I endeavoured to carry out certain experiments on the subject of the "steam tent" a few years ago in which the temperature of the inspired air was measured under laboratory conditions. It was clear that dangerous effects are easily produced if the experimental animal in the "steam tent" inhales air at a temperature above 90° F., and it is better to keep the temperature inside the tent down to about 70° F. Actually the term "steam tent" is misleading: all that is required in most cases is a fully saturated atmosphere at about 70° F. Medicaments added to the air as vapour may afford additional benefit and the main value of such methods in relation to failure of respiration is to help in reducing spasm of certain parts of the respiratory passages and œdema of the respiratory mucosa.

OXYGEN THERAPY

It must first be clearly emphasised that oxygen is not a respiratory stimulant, and that if it is to be effective in the treatment of any type of respiratory failure it must reach the lungs in adequate concentration. The use of oxygen in respiratory failure is, however, of the greatest importance, since oxygen-lack produces severe and even permanent damage to the tissue cells of the body, including those of the central nervous system. As a rule it is the tension of the oxygen in the arterial blood which is the important factor in determining the supply of oxygen to the tissues, and it is only in "anoxic anoxæmia"—i.e., reduced oxygen tension in arterial blood—that a supply of oxygen by inhalation is likely to do good. From a scientific aspect, as already mentioned in Lect. II., cyanosis is no guide to the degree or even presence of anoxic anoxæmia, and although acute respiratory failure associated with cyanosis often benefits from oxygen therapy, it is also true that patients without cyanosis also benefit because arterial unsaturation may be present. In practice anoxic anoxæmia most often occurs in acute inflammatory conditions of the pulmonary epithelium (pneumonia, pulmonary œdema) and is also seen in the rapid, shallow type of breathing already mentioned (Lect. I.), in partial collapse (or unexpanded portions of lung), and as a more chronic condition in emphysema and certain types of congenital heart disease (right to left shunt). In theory the determination of arterial desaturation ought to be made the absolute criterion for the use of oxygen. In practice, as Poulton[15] has pointed out, it is often valuable to test the effect on a patient of letting him breathe oxygen from a rubber bag through a mask for 5–10 minutes to see if beneficial effects are obtained as regards comfort, colour, degree of respiratory effort, position in bed, &c. Good reviews of the whole subject may be found† in addition to Poulton's contribution, in recent papers by Boothby[16] and by Richards and Barach.[17]

If oxygen is to be administered it must be used in an efficient manner. The traditional glass funnel has of late years been condemned in such strong terms that there seems to be little need for repeating that even when it is attached to a cylinder of pure oxygen with rapidly delivered gas and held within an inch or so of the face, such a funnel has no effect whatever upon the alveolar oxygen content or upon the arterial oxygen tension. The use of the subcutaneous and intraperitoneal routes have likewise no scientific evidence in their favour and certainly some against. The methods available for the use of oxygen resolve themselves into (1) oxygen chambers; (2) oxygen tents; (3) masks; and (4) the nasal catheter (with extension of intubation into the trachea in certain circumstances).

Richard and Barach[17] have recently discussed the question of prolonged residence in high oxygen atmospheres—which is where the oxygen chamber is of value—and there is no need for further comment, except to point out, firstly, that in the early stages of oxygen therapy in this way rapid shallow breathing may develop owing to improved conditions of tissue oxidation, and secondly, that there is a real danger, for patients with chronic oxygen desaturation, that residence in an oxygen chamber will prevent their living in comfort outside (Boothby).[16] The value of an oxygen chamber for the new-born has probably been insufficiently appreciated in this country. Boothby's modification of the Hess incubator[18] for this purpose is a useful contribution.

Poulton[15] has advocated the use of the oxygen tent, and in his expert hands the type he has devised is certainly effective for the type of patient with acute anoxic anoxæmia already mentioned. The main difficulties of keeping the "atmosphere" in such a tent cool and not too moist and of regulating the carbon-dioxide content to about 2 per cent. appear to have been surmounted, but for routine use in everyday life the choice seems to lie between the mask and the nasal catheter, neither of which is wholly satisfactory. The mask is undoubtedly the most effective means of getting oxygen into a patient who needs it, but it is uncomfortable for anything but temporary use, and while admirable in the unconscious patient, generally fails with other types even although benefit is obtained by its use. Curiously enough in my experience, both in adults and children, oxygen efficiently administered—in pneumonic conditions, for example—often seems to produce restlessness, and the docile ill patient who appears at first to be willing and able to tolerate everything is soon, under the influence of oxygen, resisting and rebellious! Poulton has informed me (personal communication) that he has met with the same difficulty with his oxygen tent. The nasal catheter can be made moderately comfortable—by the use of an anæsthetic ointment, spraying of the throat with liquid paraffin, and making the oxygen moist—and moderately efficient if care is taken to see that the catheter reaches well into the oropharynx—i.e., the tip must be seen below the soft palate—and that the rate of flow is, for an adult, not less than 6–10 litres per minute.

In any method of giving oxygen, but more especially in the use of the mask, tent, or oxygen chamber, it must be borne in mind that pure oxygen is an irritant to the respiratory mucosa and a concentration of 50 per cent. should not be exceeded.

CARBON DIOXIDE

I have purposely put oxygen therapy before discussing carbon dioxide, for there is a tendency at the present day to exaggerate the value of the latter, while relatively neglecting the former. The Sparklet of carbon dioxide can never be of such life-saving value as a cylinder of oxygen. Nevertheless carbon dioxide is of great value as a respiratory stimulant and, while the physiologists are disagreeing as to its action,

† Since this lecture was prepared there has appeared Oxygen and Carbon Dioxide Therapy by Argyll Campbell and E. P. Poulton, London, 1934. It covers much the same field as the present section, containing a valuable and extensive bibliography.

its practical effect is illustrated by the story of the doctor in America who fetched round the fire brigade to resuscitate his own new-born infant with this gas, since he had been so impressed with the use of carbon dioxide in the resuscitation of an adult. The gas is particularly indicated in shallow breathing, to produce a greater depth (and hence greater ventilating efficiency) and in deep breathing—i.e., under anæsthesia—where there is a risk of the carbon dioxide being excessively washed out of the blood. It is of value in resuscitating the new-born and in promoting expansion of unexpanded lungs. It is also of great value in carbon-monoxide poisoning, and where the respiratory centre is depressed and less sensitive than normal, as in morphine poisoning. Henderson must be given the credit for strongly urging the more extensive use of carbon dioxide for many years. The first important paper [19] on the subject by him and his co-workers appeared in 1920 and he has ardently defended the method ever since.

Just as in theory oxygen therapy is likely to be most effective if based upon estimation of the arterial oxygen tension, so carbon-dioxide inhalation is only indicated, according to strict analysis, if the carbon dioxide tension of the blood is below normal. Thus the use of this gas for examples of respiratory failure in the new-born has been condemned by some authorities (Eastman,[20] Kane and Kreiselman [21]) on the grounds that it is only likely to increase the degree of "acidosis" present. Henderson replies [7] to this that whatever may be the results of blood-gas analysis his method proves effective, and paradoxically carbon dioxide improves the situation by "mobilising" the alkali reserve.

Used in concentrations of 5–7 per cent. with oxygen, carbon dioxide appears to be without danger. Occasional inhalations of pure carbon dioxide are recommended by some authors but appear to offer certain risks and no particular advantage over smelling-salts as an irritant to the nasal and respiratory mucosa. The gas mixtures are best given through the mask for everyday use. This should be connected to a cylinder with a reducing valve and have a simple water manometer in the form of a glass side tube which can be immersed under water at whatever depth desired. For prolonged use—as in the shallow breathing of pneumonia—the nasal catheter method is the most practicable. Anæmic patients are said to react badly to carbon dioxide (Henderson [7]) and the gas is best not given even if over-ventilation is clearly reducing the carbon-dioxide content of the blood until the oxygen-carrying power has been restored by a transfusion.

Drugs as Respiratory Stimulants

The use of drugs as respiratory stimulants only too often leads to disappointment and sometimes harm may actually be done. Henderson holds strong views on this subject which may be illustrated by two quotations from his most recent paper [7]: "All subcutaneous, intravenous or intra-cardiac medication is harmful rather than beneficial in asphyxia." Writing more especially of the treatment of carbon-monoxide poisoning, he states that "respiratory stimulants are generally cardiac depressants."

Before examining the merits of the three most popular drugs as respiratory stimulants, I should like to make two introductory remarks. Firstly, in all laboratory experiments with drugs of this class it is important to record the blood pressure as well as the respiration, and it is also essential to test the drug not only on the animal with normal respiratory centres, but also after this centre has been damaged or depressed—as, for example, by a preliminary dose of morphine. Isolated tracings of the respiration before and after a certain drug has been given do not tell the whole truth. The second point is that in certain circumstances tests of drugs can be made upon human patients in a way that closely mimics the customary pharmacological experiment in the laboratory. While working in Hamburg with H. W. Knipping and W. H. Lewis, I was able to do this on several occasions when treating patients suffering from the effects of morphine and other sedative drugs taken in attempts at suicide. We

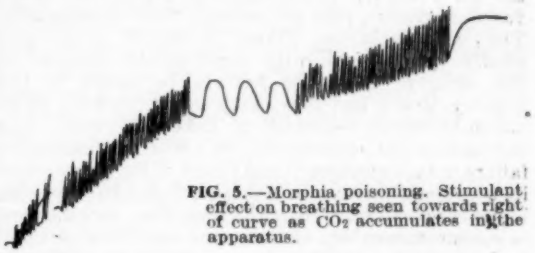

FIG. 5.—Morphia poisoning. Stimulant effect on breathing seen towards right of curve as CO_2 accumulates in the apparatus.

administered oxygen to these patients from a recording spirometer apparatus (similar to the pattern mentioned in Lect. II.) by means of a large mask strapped over the face. The breathing was recorded on a revolving drum and the effects of certain drugs noted. While definite stimulation of the breathing could always be obtained (save in the moribund) by allowing carbon dioxide to accumulate [22] (Fig. 5) and also by lobeline and similar drugs, the most striking feature of the tests was the complete absence of any regular stimulant effect upon respiration by strychnine, caffeine, atropine, pituitrin, or adrenaline, although occasionally a period of irregular breathing followed the use of the latter drug.

I will now discuss briefly the value of three drugs widely used to-day as respiratory stimulants—Lobeline, Icoral, and Coramine.

LOBELINE

The pharamacological action of this member of the nicotine series is essentially depression and ultimately paralysis of certain nerve-cells and motor nerve-endings (Dixon [23]); but on intravenous injection of lobeline there is a brief period of opposite effect—namely, stimulation—in which the nervous control of respiration shares. Curtis and Wright [24] concluded, after an extensive pharmacological investigation of this drug on animals, that lobeline was certainly a powerful respiratory stimulant, but that doses necessary to produce increased breathing have widespread effects upon other systems, such as a depressant effect upon the heart. These workers suggested that combination with a circulatory stimulant might render it safer for human subjects—an attempt at which has been made in the preparation known as icoral (see below). My own experience with lobeline, both in a limited series of laboratory experiments and in clinical use of the drug especially in respiratory failure in the new-born, entirely bears out these views. It will certainly stimulate respiration but subsequent depressant effects have not infrequently been observed. Lee [25] has reported two instances of generalised twitchings, rigidity, and opisthotonos in young babies, attributed to the use of lobeline, with eventual recovery. Oberbeck,[26] on the other hand, has written an enthusiastic note on the value of the drug in respiratory failure

of the new-born, recommending the use of 1/20 grain of "alpha lobeline." In summing up the points regarding this drug I would suggest that it be used only in extreme emergency, in a single dose—i.e., never repeated in less than twelve hours—and be followed as soon as possible by measures to counteract any circulatory depression.

ICORAL

As stated above this preparation is an attempt to overcome the risks of lobeline. It is a solution of two synthetic bases, one with a central stimulant effect upon the respiration similar to lobeline, and the other with a stimulant effect upon the cardio-vascular system, said to resemble that of adrenaline. The manufacturers (Bayer Products Ltd.) very kindly supplied me with experimental samples of this drug in 1933, the first to be issued in this country, and I had previously seen something of its use in Germany, especially at Eckstein's clinic. The last-named has reported on its value for respiratory failure in the new-born,[27] and Frank [28] has summarised its use in adults, especially those suffering from poisoning of the respiratory centre by morphine, barbiturates, or carbon monoxide. In experimental trials of icoral in decerebrate cats or in animals under the influence of excessive doses of morphine two main results were obtained:—

Firstly, the stimulant effect on respiration was very variable and sometimes only slight, while carbon-dioxide inhalation would greatly improve the breathing in instances where the icoral had failed. Secondly, one not infrequently met with the "adrenaline apnœa" effect (Wright [29]): a rise in blood pressure, produced by the adrenaline-like element of the icoral, led to a cessation of breathing lasting for 20–30 seconds, sometimes followed by stimulation of respiration and sometimes by the development of irregular or periodic breathing.

Depressant after-effects upon the circulation seemed to be absent with this drug (in contrast with lobeline), but the production of apnœa seems to be a possible danger if the drug is used intravenously. Clinically by intramuscular use this effect has not been observed, but it might possibly occur if the dose was increased. My main impression clinically (again mainly with the new-born) is that icoral is relatively safe, especially in the dosage recommended for small children, but that results are variable and to that extent the drug is unreliable.

CORAMINE

The Clayton Aniline Company kindly placed some of this substance at my disposal for experimental tests. Although there are now many records of pharmacological studies of this drug (especially in foreign journals), I have not been able to find details of the action of this substance upon cats, and I wished to compare the effects with those already obtained on the morphinised animal with lobeline, icoral, and carbon-dioxide inhalation. My results showed that coramine could be relied upon to produce a stimulant effect upon respiration in this type of experiment and there was no preliminary apnœa effect (Fig. 6). On the other hand, using a dose of the drug intravenously comparable to that advised for the new-born baby, generalised convulsions occurred more than once in my experiments, while some degree of twitching was seldom absent. In clinical use of the drug in the new-born the ward sisters have often complained that the babies are restless after its injection, although I have not yet seen actual twitchings or convulsions. Fuller details of the effects of coramine can be found in such papers as those by Faust,[30] Kennedy,[31] Killian,[32] and Daly.[33] It is certainly a powerful stimulant of respiration, being especially valuable when the centre is depressed. There appears to be no danger of circulatory depression nor of the adrenaline-apnœa effect upon respiration. Although the convulsive dose is stated to be many times the therapeutic dose, my own limited experience indicates that in certain circumstances there is a danger of excessive stimulation of the nervous system as a whole.

FIG. 6.—Stimulant effect of coramine (1·5 c.cm. of 2 per cent. solution intravenously) upon respiration of a morphinised cat.

The ideal respiratory stimulant has not yet been prepared; it should have a selective action on the respiratory centres, an action which is prolonged with no secondary depression. Other tissues and systems of the body should be unaffected. The toxic dose should be far removed from the therapeutic dose. The drug should be reliable and be capable of stimulating even the heavily poisoned centre. No drug, however, will ever be a substitute for prompt action in respiratory failure as regards removal of obstruction and the application of artificial respiration.

Treatment in the New-born

The resuscitation of the new-born baby with respiratory difficulty depends upon the principles already outlined. It must be emphasised that there is no essential difference in treatment for "blue" and for "white" asphyxia and that two primary considerations must never be ignored—namely, the supply of warmth and the great importance of gentleness. Although modern writers on the subject almost without exception begin by urging gentleness, not a few go on to include under treatment the holding of a baby up by his feet, while "milking" the trachea and smacking is still justified by certain authorities. A leading text-book on obstetrics, while pointing out that many babies are lost by violent attempts at artificial respiration, gives opposite this a page of illustrations which fully justify Henderson's [34] description in regard to the old teaching on this subject as "crude, ineffective, and reprehensible." McIlroy [35] puts the matter quite bluntly when she states that artificial respiration has probably helped to maintain the stillbirth-rate. It must, however, be borne in mind that alternatives to the older barbaric methods of smacking, bending, twirling round by the feet, &c., must not be too complex for everyday use.

A large proportion of babies not immediately crying after delivery respond to adequate clearing out of obstructive material in the pharynx. A piece of gauze on the finger followed, if required, by aspiration through a soft rubber or gum-elastic catheter is sufficient for most instances. Where suction is employed a glass trap should intervene between the patient and the mouth of the sucker. Stronger suction can often be obtained with greater convenience by the use of a rubber "ear bulb" connected through a trap bottle. In modern institutions, where a supply of negative pressure ought to be "on tap," a more efficient suction still can be obtained. At present I am trying to adapt Mollison's "suction and air delivery unit" [36] for use in the new-born. Where simple toilet of the nasopharynx

and if necessary slight forward traction of the tongue to secure an air-way does not lead to prompt inspiration, then a soft rubber mask of the type mentioned by McIlroy [35] should be applied to the face and 5 per cent. carbon dioxide in oxygen administered, the mask being lifted and applied to the face alternately at a rate of about twenty times per minute. (A manometer attached to such a supply should not exceed 8 in. of water pressure.) A rubber anæsthetic bag filled with air plus the contents of a small Sparklet bulb gives a useful alternative in domiciliary practice. Meanwhile, if breathing does not promptly begin 0·5 c.cm. of coramine solution should be given intramuscularly.

Those babies who do not respond to these measures are in a serious state and often die. They are pale, atonic, and fall into the group of "white asphyxia." Intubation would probably save a certain number of them, and I have been impressed by the work of Flagg,[37] Mathieu and Holman,[38] Brown,[39] and Péry and others [40] on this aspect of the subject. Flagg recommends the use of a special type of laryngoscope for direct vision of the larynx, while some of the others consider this unnecessary, stating that a slightly stiffened catheter can easily be guided into the trachea. My own experience is that with a completely atonic moribund baby a catheter can be introduced blindly, but that in those infants where there is still some life and resistance—where feeble attempts at respiration are being or have been made—direct vision is desirable; and Messrs. Down Bros. have made a small "portable" type of electric laryngoscope for this purpose (Fig. 7). Adequate suction and cleansing of the lower respiratory tract can be obtained in this way, followed by insufflation of oxygen and carbon dioxide into the trachea. This may be accomplished directly from a gas cylinder as long as a water manometer "trap" is present in a side tube (with a maximum depth of 8 in. of tube immersed in water). Rhythmical insufflation is to be preferred and something after the style of Mollison's air-delivery unit (see above) may prove to be useful.

FIG. 7.—Laryngoscope (after a pattern suggested by Mr. G. F. Gibberd, F.R.C.S.).

The reason for this great insistence upon the slight increase in pressure of inspired gas, the importance of suction—i.e., negative pressure—apart from its cleansing effects and the value of rhythm lies in an appreciation of the importance of the Hering-Breuer reflex. The increase in inspiratory pressure in the lungs initiates expiratory movements and vice versa. The sooner this can be brought into action the better, and to this end one breath by the baby is better than any amount of air introduced by artificial respiration. Once breathing has begun the main requirement of the infant in difficulty is oxygen. This especially applies to the weak or premature infant, and Boothby,[18] as already mentioned, has adapted the Hess incubator for this purpose. Even when breathing appears to be safely established it is important to secure full expansion of the lungs, and the daily use of a period of carbon dioxide and oxygen therapy is to be recommended to prevent the development of fatal broncho-pneumonia. For the morphinised baby who remains blue, and for the baby with attacks of respiratory failure, I believe some form of Drinker apparatus probably offers the safest type of treatment; but I have no experience of this.

Finally, a word may be said against certain measures. Artificial respiration in the sense of moving the chest even gently stands condemned in any form until inspiration has begun, and once a breath has been taken it is no longer necessary. The use of pure carbon dioxide seems to me dangerous in view of the findings regarding the presence of uncompensated acidosis in many of these babies. Allowing some blood to escape from the cord also seems to me of doubtful value: in the "full blooded" baby it is unnecessary, since respiration will promptly restore the balance between the blood in the greater and lesser circulation and in the "pale" baby it can only do harm. Injection of drugs into the umbilical vein also offers possible dangers.

In conclusion it must be mentioned that the work upon which these lectures have been based was made possible firstly by a Rockefeller medical fellowship held in Hamburg in 1930–31, and secondly by a part-time personal grant from the Medical Research Council for three years after my return to London. For supervision and help in Hamburg I am indebted to Profs. L. Brauer and W. Knipping and to Dr. W. H. Lewis, now of New York. In London my colleagues, Dr. R. A. Young and Prof. Samson Wright, have given me continual advice and encouragement and my thanks are tendered to them both.

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CYSTS IN OR ALONGSIDE OF HERNIAL SACS

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Hernial sacs, while themselves essentially a departure from the normal plan of the body, are so common as to cause no surprise. Their situation and anatomical relationships, likewise the constitution of the sac wall, are all so constant that variations may be looked upon as pathological. Such variations are, if one may judge from the literature, relatively rare. They comprise, mainly, hydrocele of the sac, omental and other cysts, hernia encystica, and tumours. Further, in the neighbourhood of the sac (e.g., inguinal canal) a certain number of examples of epidermoid or dermoid cyst have been recorded. The present communication deals with five cases of cystic formations in or alongside of hernial sacs.

CASE RECORDS

Case 1. *Large pedunculated cyst in a femoral sac distended with fluid.*—A spare and healthy looking unmarried woman, aged about 45, was seen in 1910 with irreducible femoral hernia on the right side. The hernia had first appeared eight years previously, and had been treated with a truss. Some months before I saw her the hernia had become irreducible and she had had to discard the truss. Otherwise the swelling had not given her any trouble. Her doctor feared that the hernia had become incarcerated and called for operation. At operation the sac was found to contain several drachms of clear, straw-coloured fluid under considerable pressure. Further inspection showed in the sac a body resembling a knuckle of bowel, purple in colour. This proved to be a pedunculated cyst (Fig. 1) the size of a plum, and having a diameter of 4 cm. The pedicle was 2 cm. long and 1 cm. thick, and sprang from the posterior wall of the sac. The sac, which was otherwise empty and showed diverticula, was separated up to its neck, ligated, and removed along with adherent femoral glands. The neck was bulky; but its lumen was narrow, being compressed by the hypertrophied subperitoneal fat. Recovery was uneventful.

Examination of the specimen showed that the peduncle spread out as it neared the cyst and was clearly demarcated from that body. From its edge vessels radiated over the thin wall of the cyst. From the termination of the peduncle there arose a double spherical body having a diameter of 1 cm. Outside of the hernial sac the peduncle could be followed as an apparently vascular band. No histological examination was made.

Case 2. *Small pedunculated cyst in an inguinal sac distended with fluid.*—Mrs. A., aged 46, was seen in January, 1934, with right inguinal hernia of two years' duration, appearing seven years after an operation for suppurative appendicitis. The hernial swelling had increased a little but always disappeared when patient lay down. Some pain or discomfort in the swelling had been more severe of late.

Examination showed a weak appendicectomy scar, bulging on coughing. Slight swelling seen in region of inguinal canal increased on coughing. At operation a cystic swelling projected from superficial inguinal ring. When canal was laid open a sac-like body was displayed containing watery fluid. Dressing forceps in sac could not be passed into the abdominal cavity. The sac contained a stalked cystic polyp of the size and appearance of a white currant. The sac was separated up to deep ring, ligated, and removed along with the adherent round ligament, and the canal was closed with Bassini stitches. Recovery was uneventful.

Histological examination by Dr. Janet Niven showed that the cystic structure contained amorphous material and was lined by flattened epithelium (? serosal) surrounded externally by connective tissue. The cord-like structure contained strands of longitudinally disposed smooth muscle, rather degenerate histologically. The tissue was richly supplied with capillaries and fairly large blood-vessels at the periphery. No evidence of Fallopian tube-like structures was found. With the exception of cystic formations the tissue of the pedicle corresponded generally in its histology with that found in normal round ligaments from subjects of approximately the same age.

FIG. 1 (Case 1).—Photograph of pedunculated cyst after evagination of sac. Small body springing from spread-out termination of peduncle on cyst plainly seen (one-third natural size).

Case 3. *Parasaccular cyst below and behind fundus of a femoral sac.*—Mrs. B., aged 42, came under my care in February, 1934, on account of a left femoral hernia of 18 months' duration. It had gradually increased in size after being first noticed, and six months before I saw her some pain was felt, and had become worse during the last four weeks. The swelling had never completely disappeared, even during recumbency. Examination showed swelling in region of a femoral hernia. Increase in size was noticed on exertion but not markedly on coughing. At operation a cystic swelling was found, associated with a lipoma-like formation which on being traced up the femoral canal was discovered to envelop a hernial sac, the fat being thicker posteriorly. The sac, which passed down to but did not communicate with the cyst, was ligated and removed with the cyst, and the canal was closed. Recovery was uneventful.

Injection of the sac after removal transmitted to the cyst an impulse, showing close relationship of sac wall with that of the cyst. On cutting into the specimen after hardening, the upper part of the cyst was found to pass upwards for some distance obliquely behind the sac (Fig. 2), and completely separated from it.

Histological examination by Dr. Alan C. Lendrum of the tissue where the sac was in contact with the cyst showed that sac and cystic structure alike were lined by a single layer of cells of "mesothelial type." The septum was composed of connective tissue presenting a slight degree of round-celled infiltration not clearly inflammatory in origin.

Case 4. *Closed saccule at lower end of and not communicating with femoral sac.*—A man, aged 47, was seen in March, 1934, with "double rupture" of six months' duration. Examination showed femoral hernia and scar of inguinal hernia operation, both on right side; also a slight inguinal hernia on left side. At operation the femoral hernia was found to have a lipomatous sac. Sac was ligated and removed. Recovery was uninterrupted. On inspection of the sac a saccule, about the size of a pea, was found at its lower end. The saccule was completely separated by a septum from the cavity of the sac, into which it slightly bulged. No histological examination was made.

Case 5. *Parasaccular cyst projecting at saphenous opening and attached to fundus of femoral sac.*—Mrs. C., aged 34, nullipara, seen in December, 1934, stated that following a "strain" about four years ago, when "something seemed to have come out of place," she noticed swelling at inner end of right groin. The swelling remained of small size, and when seen by her doctor twelve months ago it was in the region of a femoral hernia, irreducible and without any impulse on coughing. No actual pain experienced, but was uncomfortable at menstrual periods.

Had increased in size during week before seen by me, at which time the swelling was globular, about size of a walnut, irreducible and without impulse on coughing, and it occupied position of a femoral hernia. It was mobile on its deep attachment and felt fluctuant like a cyst.

Operation on Jan. 10th, 1935, showed the swelling to be a cyst firmly attached posteriorly to a narrow, empty femoral sac. On opening the sac a drop or two of clear watery fluid escaped. Communication with abdominal cavity was patent. Radical operation for femoral hernia was performed, and recovery was uninterrupted.

Histological examination of sac and attached cyst, by Dr. Janet Niven, showed the distal end of femoral sac thrown into a cup shape where it embraced the upper part of cyst, and while generally smooth there was at one spot a projection into the sac cavity (see diagram, Fig. 3). The sac wall consisted of vascular fibro-areolar tissue, and was lined by cubical epithelium which in parts had been stripped off. The structure of the cyst wall was similar to that of the sac, and the two cavities were separated by a continuous layer of the extraperitoneal vascular fibro-areolar tissue (Fig. 3). At no part did the tissues show any evidence of recent acute or chronic inflammation.

REMARKS

These cases seem to be examples of two different types of cystic formations arising in connexion with hernial sacs, viz.: (*a*) intrasaccular, pedunculated (Cases 1 and 2); and (*b*) parasaccular cysts (3, 4, and 5).

Sac.—Four of the five (1, 3, 4, and 5) were in connexion with a femoral; the fifth (2) was in an inguinal sac.

Sex.—Two parasaccular and both intrasaccular pedunculated cysts were in females.

Symptomatology.—In the four female patients there was a history of groin-swelling of several years' duration. While in Cases 1 and 2 it was at first reducible, in Case 3 it had never been completely so. In all four pain or discomfort and increase of swelling had supervened. In the male patient there was no history of special discomfort. In none of the cases were there any signs pointing definitely to cyst or to hydrocele of the sac.

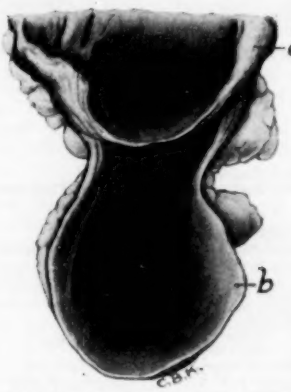

FIG. 2 (Case 3).—Drawing (semi-diagrammatic) of specimen laid open anteriorly after hardening, (*a*) sac, (*b*) cyst. Note septum passing obliquely backwards and upwards, and completely separating cyst cavity from that of sac.

(*Figs. 2 and 3 are from drawings by Miss Brown Kelly.*)

Operation findings. In both cases of intrasaccular pedunculated cysts the containing hernial sac was distended with clear, straw-coloured fluid. In the parasaccular cases the sac was empty. Three of the femoral sacs were more or less markedly lipomatous—i.e., surrounded by thickened extraperitoneal fat. In none of the cases were there any traces of omentum or of Fallopian tube.

Histology.—In the three cases (one intrasaccular and two parasaccular) examined the cyst had a connective tissue wall, lined by (?) serosal or "mesothelial type" cells. The peduncle of the intrasaccular cyst was practically solid and showed strands of smooth muscle, with tiny cystic structures, and richly supplied with blood-vessels and capillaries. It corresponded with the histological characters of the round ligament of the uterus.

Pathology.—(*a*) In the intrasaccular form of cyst the origin in Case 2 would seem to be firstly the pathological change in the round ligament, and, resulting from the close relationship of the ligament to an inguinal hernial sac, a secondary projection or invagination of one of the cysts into the sac. The production of the stalk is probably due to the invaginated cyst being subjected to traction by the repeated descent of the hernia, so that a polyp comes to be formed as in polypoid adenoma of the rectum. Muscular movements in the neighbourhood of the sac might also be a factor in bringing about traction. In Case 1 there was no microscopic examination to decide the origin or nature of the polyp. It is unlikely that the round ligament would have any such intimate relationship to a femoral sac, as is normally seen in the case of an inguinal sac, although gubernacular fibres in connexion with a femoral sac in the male have been described by R. W. Murray.[1] The relation of the pedicle in Case 1 to the vascular band seen on dissecting the sac suggests a primarily extrasaccular cyst, of unknown origin, the subsequent pedunculation being brought about as in Case 2. (*b*) The occurrence of parasaccular cyst has its *probable* origin in a diverticulum of the hernial sac, afterwards shut off from the main cavity. Since in Cases 3, 4, and 5 these cysts existed at the distal end of the sac, any pressure by the contents of the sac would act by preventing traction and the formation of a polyp. Presumably the shutting-off of such diverticula would depend on inflammation; but no evidences of such were found on histological examination of Cases 3 and 5 of the present series.

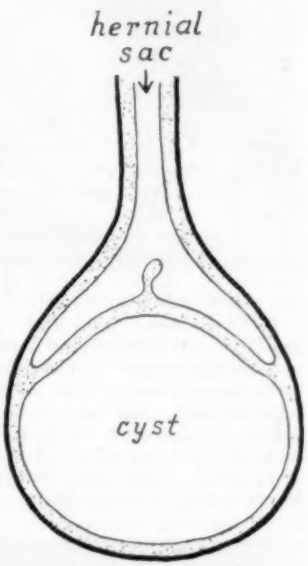

FIG. 3.—Diagram of parts from Case 5. Stippling represents vascular fibro-areolar tissue external to both sac and cyst, and forming continuous layer between them. Thin line represents the epithelial lining of sac and cyst. Note papilliform projection invaginating epithelium of sac.

LITERATURE

1. *Hydrocele of sac.*—Erichsen[2] refers to such a condition, under the heading of "exudation cysts." The occurrence is occasionally met with in abdominal herniæ, and the hydrocele is evidently formed by obliteration of the neck of the sac, with subsequent exudation into the closed cavity. Further on[3] the same author in his chapter on hernia states that hydrocele of the sac may occur at the bottom of an old sac which has been cut off from communication with the peritoneum by adhesions of intestine or omentum in the upper part, or in the neck of the sac. Such an occurrence is, however, rare. In

none of my cases were such adhesions present. Treves [4] describes ridges and folds of various consistence in the inner surface of the sac in ruptures of some standing where there has occurred local peritonitis. He goes on to mention the occurrence of diverticula (in femoral hernia), of constrictions, and of adherent omentum occluding the mouth of the sac. In the case of the last a hydrocele of the sac may occur. Bland-Sutton [5] also refers to hydrocele of the sac in cases where the neck of the sac is so narrowed that neither gut nor omentum passes it.

2. *Omental cysts.*—Erichsen [6] states that cysts containing fluid may be met with in epiplocele; and Treves,[7] that cysts may occur also in hypertrophied herniated omentum "in spaces enclosed by adhesions" (p. 669). Howe [8] records an interesting case in an infant, aged 1½ years, where an enormous cyst of omentum occupied the open processus vaginalis and was successfully removed by Morley. The scrotal swelling was first noticed at the age of six weeks. At the time of operation it had attained the size of a large coconut.

3. *Cysts connected with hernial sacs.*—Murray in 1916 contributed an interesting paper to the *Annals of Surgery* [9] on the ætiology of cysts connected with hernial sacs. His communication deals with inguinal sacs, and he rather ingeniously refers the origin of such cysts to irregularity in the formation and in the occlusion of the processus vaginalis. Hutchinson [10] describes in his monograph on hernia the following: "In one remarkable case of large right inguinal hernia a thick-walled cyst was met with bulging on the inner side of the sac. Having made certain that it did not communicate with the bladder, I opened it—*letting out straw-coloured fluid like urine*—but its origin remained a complete mystery." It was possibly similar to those described in Murray's paper (*v. supra*), but in the absence of details we must leave it at that.

4. *Hernia encystica.*—In Case 2 of the present series, when the sac was opened the appearances at first sight suggested the condition of encysted hernia. Closer inspection of the contents showed that the contained structure was not a hernial sac but a pedunculated cyst, with apparently a solid stalk. This was confirmed on histological examination. Inguinal hernia encystica in the female would seem to be uncommon. Knopp,[11] writing in 1927, found at that date only 27 cases on record. Of these, 4 were in women. The discomfort which comes on as a late symptom he attributes to pressure and traction at the seat of obliteration. He frankly confesses that the diagnosis of the actual condition is only made at time of operation. In my case the disappearance of complaints after radical operation would point to pressure on the cyst being the cause of the discomfort. Schroeder [12] reports a case of hernia encystica in a male, aged 19. The contained hernial diverticulum had glassy, transparent wall, and depended from a small stalk which felt firm. Histological examination showed the structure to be a sac, formed by intraperitoneal pressure bulging the seat of obliteration of the processus vaginalis. Seifert [13] describes the formation of accessory spaces, or diverticula, which may be more or less shut off from the cavity of the sac, and into which the sac may bulge, the condition coming to resemble an encysted hernia. Oberst [14] found secondary sacs in an inguinal hernial sac in a case of tuberculous peritonitis with ascites. These "sacs" were attached by slender necks to the peritoneum within the ring. Histologically they were pseudo-sacs, and were not even cystic, but consisted of slender connective tissue whose wide meshes contained œdematous fluid. He considered that they were prolapsed folds from the neck of the sac, and had prolapsed as the result of expiratory or other efforts.

5. *Tumours.*—According to Richard [15] the occurrence of tumours arising from the contents of a hernial sac is seldom found in literature, while primary tumour of the sac is extremely rare. After referring to three cases in which the sac was the seat of metastatic deposits, and in which the seat of the primary tumour was not determined, he proceeds to record a case of tumour arising from the contents of the sac—viz., fibroma of a mesenteric gland in a male, aged 28. Cases of tumour simulate incarcerated or strangulated hernia, and the true state of affairs is only revealed at operation.

6. *Dermoid or epidermoid cysts in inguinal canal.*—Though not germane to the condition under consideration, mention may be made of such cysts. The bibliography is not extensive; but the occurrence has been noted by Englisch,[16] Gould,[17] Paterson,[18] Wrede,[19] and Gasparini.[20] The condition is usually mistaken for an inguinal hernia, and its true nature is only demonstrated at operation. In three of the cases recorded the cyst had a close relationship to the spermatic cord.

SUMMARY

1. The occurrence of cystic formations in hernial sacs is relatively rare. 2. The five cases here recorded were not diagnosed before operation. 3. Four of the five experienced local discomfort late in the course of the case. 4. The origin of the cysts is not the same in all cases. 5. Parasaccular cysts probably arise from the secondary closure of a diverticulum of the sac. 6. The stalked cysts are not so easily explained. One of the present series arose in connexion with the round ligament; the other has possibly the same origin. In these cases the cyst had been seated high up in the sac, and, being exposed to dragging, had come to form a polyp.

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WAITING BY HOSPITAL OUT-PATIENTS.—Efforts to reduce the time of waiting of out-patients are being made by the out-patients' arrangements committee of King Edward's Hospital Fund for London. The committee have come to the conclusion that at many hospitals the time spent at the dispensary by the patients is quite short and that where there is waiting it is because the premises are too small or because there are excessive peak-load pressures at rush hours. A memorandum on its conclusions has been prepared by the committee to assist hospitals to ascertain whether their own waiting time is capable of reduction and, if so, how to reduce it.

FRACTURE OF NEWLY FORMED BONE

By Prof. B. Fuchs

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The following case shows that the process of healing after fracture may correspond less to the age of the patient than to the age of his newly formed bone. It also illustrates restoration of the elbow-joint in difficult circumstances.

The patient, a painter aged 54, fell from the fourth floor of a house on to an asphalt pavement in 1931. He received a contused wound in the left frontal region, a fracture of the left hip, and a complicated fracture of the lower end of the left humerus, with considerable splintering into the elbow-joint. At operation the frontal wound was found to go right down to the dura mater. The wound at the back of the elbow was extended by the Langenbeck incision. The lower part of the humerus was found to be broken into several pieces, some of which

FIG. 1.—Radiogram taken five months after the operation.

were loose while others were joined by periosteum, and the end of the olecranon was broken off. The entire lower part of the humerus was removed, together with the broken piece of the ulna. A drainage-tube was inserted and the arm was set in a windowed plaster-of-Paris bandage. The frontal wound and hip fracture united well, but the elbow suppurated a great deal, and during the first week the temperature rose to 40° C. Suppuration continued for 40 days. The patient was discharged 56 days after operation with the wound healed, and was further treated with baths, massage, and passive and active movements. He started work seven months after the accident, and in nine months' time was able to use his hand as if nothing had ever been wrong with it. All the movements of the elbow-joint were completely restored.

The radiogram taken five months after the operation (Fig. 1) showed a large defect in the joint, which seemed to have been replaced by a bony bridge stretching from the lower end of the humerus to the ulna, where it formed a new joint. The projection seemed to have grown along the tendon of the triceps.

Nine and a half months after the operation the patient stumbled and fell on to his left elbow on a concrete floor. The skin was uninjured, but the arm swelled and he became unable to use it. In five days a fistula appeared in the centre of the operation scar, and at the end of a month a sequestrum 1 cm. long with jagged edges was discharged. At the end of eight months a second sequestrum was removed after widening the fistula, which then healed up. The arm was not immobilised after the second accident, but was carried in a sling. Movement in the elbow reappeared in two months and attained a range of 60° in four months. There was slight atrophy of the left shoulder and forearm, but the left hand was only a little weaker than the right, and the patient is carrying on his work.

The radiograms taken two and six months after

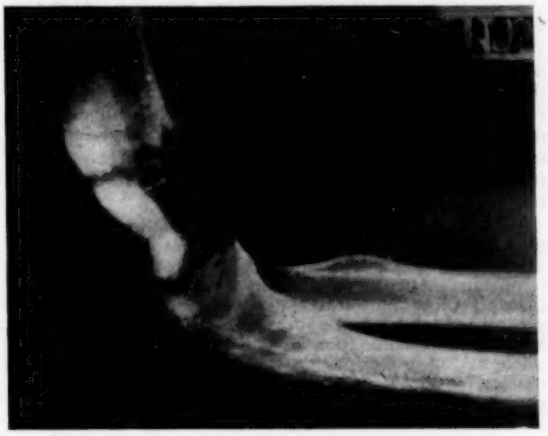

FIG. 2.—Two months after the second trauma.

the second accident (Figs. 2 and 3) show the new joint forming. The lower end of the bony projection has developed a kind of head, at first with an uneven surface and later well rounded. Fig. 2 shows the fracture of the bony projection, where it comes off the lower end of the resected humerus; Fig. 3 shows a zone of osteosclerosis replacing the line of fracture.

Thus, despite the age of the patient, his fracture

FIG. 3.—Six months after the second trauma.

in the newly formed bone tissue was healed as a child's fracture might be expected to heal, no doubt because the bone broken was young tissue.

SOME CLINICAL FEATURES OF PERFORATED JEJUNAL ULCERS

By David Trevor, M.S. Lond., F.R.C.S. Eng.

SURGICAL REGISTRAR AT CHARING CROSS HOSPITAL AND THE ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, LONDON

According to Walton [1] jejunal ulceration occurs after about 3 per cent. of gastrojejunostomy operations performed for treatment of duodenal ulcers, and after 1·6 per cent. of *all* gastrojejunostomy operations. According to the collective investigation of the Association of Surgeons [2] the incidence of jejunal ulcer after gastrojejunostomy for the treatment of duodenal ulcer is 8·6 per cent., while Ogilvie [3] states that the incidence is nearer 20 per cent. The

jejunal ulcer may perforate either into the transverse colon producing a gastrocolic fistula, or into the free peritoneal cavity. The latter catastrophe produces a clinical picture similar to that of perforated gastric or duodenal ulcer; but there are a few characteristic features which will help to distinguish it. To diagnose a perforated jejunal ulcer in a case of "acute abdomen" may seem academic, but in the second case to be described, it materially helped in execution of the operation.

CASE 1.—A man aged 33 had a posterior retrocolic gastrojejunostomy for the cure of a duodenal ulcer eighteen months previously; the symptoms had recurred recently. About five hours before admission to Charing Cross Hospital the patient developed sudden generalised abdominal pain; *he vomited six times* before admission. Examination revealed a classical picture of perforated ulcer except that there was *more tenderness and rigidity in the left iliac fossa than elsewhere.* A tentative pre-operative diagnosis of perforated jejunal ulcer was made. This I confirmed at operation: the perforated ulcer was situated distal to the anastomosis on the efferent loop.

CASE 2.—A man aged 51 had had a posterior retrocolic gastrojejunostomy eight years previously, with relief of symptoms until recently when he had a hæmatemesis. While under treatment in the medical wards he developed sudden abdominal pain, became restless, and vomited persistently; the vomit was chiefly a frothy whitish mucoid fluid. On examination the abdominal tenderness and rigidity was found to be limited chiefly to the lower half of the abdomen and more on the left side than on the right. The diagnosis of perforated jejunal ulcer was made. At operation "masses of adhesions" were encountered, so much so that when I opened the peritoneum the "hiss" of escaping gas and overflowing of the wound by free fluid did not occur. By carefully working below the transverse colon the anastomosis was reached and a perforated jejunal ulcer demonstrated. Without pre-operative diagnosis, valuable time would have been lost in freeing adhesions above the transverse colon to approach the "pyloric region."

Whereas gastrojejunostomy is the operation generally performed previous to the development of a jejunal ulcer, the latter has been recorded without any previous gastric operation.[4] A partial gastrectomy extensive enough to produce achlorhydria is not followed by gastrojejunal ulceration; where such has occurred the resection probably was insufficient.[5]

Broadly speaking, a patient with a perforated gastric ulcer does not vomit immediately after the acute condition has arisen, while with a perforated duodenal ulcer he may vomit once. A patient with a perforated jejunal ulcer, on the other hand, repeatedly vomits small quantities—as in both the cases recorded above. In perforated jejunal ulcer, too, abdominal tenderness and rigidity are more pronounced in the lower half of the abdomen than in the upper, and more on the left than the right. This is natural, for the escaping contents of the jejunum run down the left side of the vertebral column from the jejunoduodenal junction to the left iliac fossa.

Thus the premises for a diagnosis of perforated jejunal ulcer as distinct from a perforated duodenal or gastric ulcer are: (1) A previous gastrojejunostomy—though a duodenal ulcer persisting after gastrojejunostomy may perforate. (2) Frequent vomiting immediately after perforation. (3) The site of most tenderness and rigidity is the left iliac fossa.

My thanks are due to the honorary surgical staff of the Charing Cross Hospital for permission to publish the case records.

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EXCRETION OF ŒSTRIN DURING PREGNANCY

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GUY FREDERIC MARRIAN, D.Sc. Lond., F.I.C.
AND
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THE pioneer researches of Aschheim and Zondek[1] showed that the urine of pregnant women contained large amounts of œstrogenic material, which could be extracted by means of water-immiscible fat-solvents such as ether or chloroform. The same authors[2] subsequently estimated the amounts of œstrin excreted at different stages of pregnancy and concluded that the excretion rose rapidly at about the third month, maintained a high level throughout the remainder of pregnancy, and finally fell to a low level again a few days after parturition. Several attempts have since been made to determine quantitatively the amounts of œstrin excreted in pregnancy urine, but owing to the fact that such attempts were made before the difficulties involved in the procedure were fully recognised, the value of many of the published figures is doubtful.

It has long been known that the amounts of œstrin which can be extracted from pregnancy urine with ether are considerably increased by a preliminary treatment of the urine with acid. It has been shown by us that the precursor present in urine which gives rise to ether-soluble œstrin on treatment with acid has only a low œstrogenic potency when tested on ovariectomised mice. It is obvious, therefore, that unless the optimum conditions for this acid treatment are determined, no estimation of œstrin, involving the extraction of the urine with ether or the administration to the test animals of whole urine, can be considered to be quantitative. The problem is further complicated by the fact that there are present in human pregnancy urine two œstrogenic compounds, œstrone and œstriol. These differ qualitatively in biological activities, so that their relative potencies vary very considerably with the exact technique adopted in the biological assay. It follows, therefore, that unless the ratio of their amounts in pregnancy urine is constant, biological assays of urine preparations containing both œstrone and œstriol cannot yield figures that have any real quantitative significance.

Recently, in this laboratory, a simple procedure for the quantitative colorimetric assay of œstrone and œstriol has been developed.[3] It was shown that the œstriol could be nearly quantitatively separated from the œstrone by fractionation with solvents, which allowed the separate estimation of each. Furthermore, the optimum conditions of treatment with acid for complete extraction of the hormones from urine were determined. This method was successfully applied to the determination of both hormones in human pregnancy urine. It thus became possible for the first time to study quantitatively the excretion during pregnancy of (*a*) the "free" œstriol, (*b*) the "combined" œstriol, (*c*) the "free" œstrone, and (*d*) the "combined" œstrone.* In this paper the results of such a study are reported.

* The "free" œstrone or œstriol is that fraction which can be extracted from the fresh untreated urine with ether. The "combined" œstrone or œstriol is that which can only be extracted from the urine with ether after treatment with acid.

METHODS AND RESULTS

Frequent 24-hour specimens of urine were collected from a large number of women throughout pregnancy and for a few days after parturition. The estimations were carried out immediately after the collection of the samples, or when this was inconvenient, the samples were stored in the ice-box until they could be treated. By these precautions, any bacterial hydrolysis of the "combined" forms of the hormones in the urine[3 4] was prevented. The "free" and total (free + combined) hormones† were estimated on ethereal extracts of 100–300 c.cm. samples of the urine specimens.

In Fig. 1 are shown the average curves obtained from estimations carried out on 80 urine samples from 20 different pregnancy cases. After the third month of pregnancy there is a rapid increase in the amounts of "combined" œstrone and œstriol excreted. After the sixth month the rate of increase becomes greater, so that about a week before parturition there is an average daily excretion of 22 mg. of "combined" œstriol and 3 mg. of œstrone.‡ The average curves indicate that a few days before parturition there is a decrease in the amounts of "combined" œstrone and œstriol in the urine. Forty-eight hours after parturition the excretion of both has fallen to a very low level.

During the first eight months of pregnancy the "free" œstrone and œstriol is at a consistently low level, never reaching more than 1 per cent. of the amounts of the respective "combined" forms. Shortly before parturition the amounts of the "free" forms in the urine begin to increase. This increase occurs at about the same time as the decrease in the excretion of the combined forms. By 24 hours after parturition the quantities of the "free" form in the urine exceed those of the combined forms, after which they immediately decrease so that by 48 hours post partum they, too, are being excreted in very small amounts.

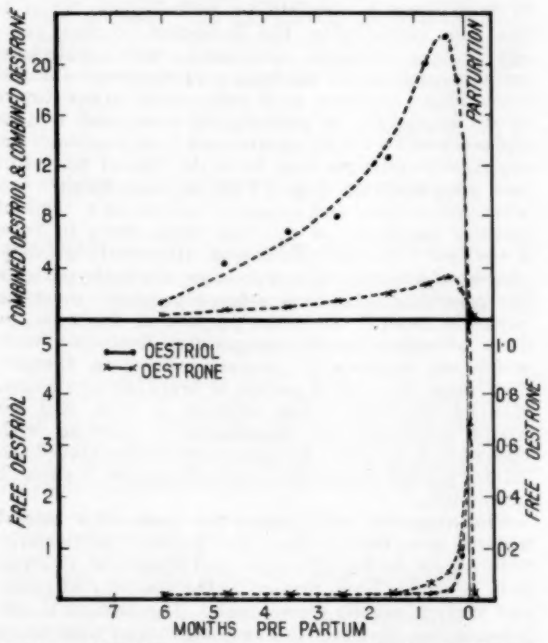

FIG. 1.—Excretion of œstrin (average curves). In this and subsequent charts the figures all relate to milligrammes excreted per 24 hours.

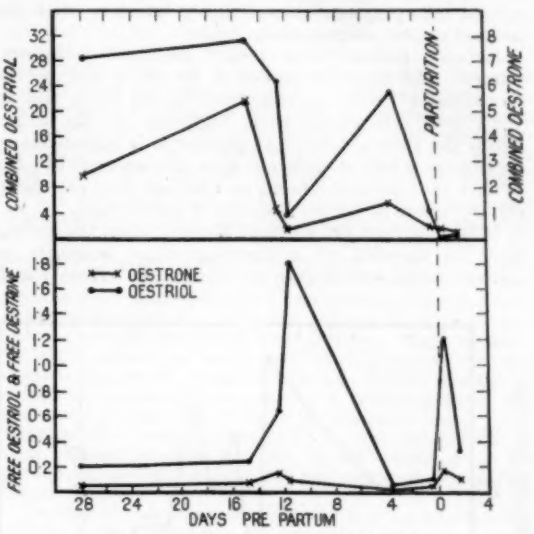

FIG. 2.—Œstrin excretion of Mrs. A.

From an examination of these average curves it might therefore be concluded that parturition is preceded and accompanied by a fall in the levels of the "combined" hormones excreted, and a rise in the levels of the "free" forms.

That these changes in œstrin excretion are associated with labour is more evident from a study of the individual data obtained from two patients, who experienced pseudo-labour during the last month of pregnancy.

The œstrin excretion of Mrs. A. (Fig. 2) followed a normal course until two weeks before parturition, when she experienced pseudo-labour which lasted for two days. During this pseudo-labour there was a very marked decrease in the amounts of "combined" œstrone and œstriol in the urine, a pronounced increase in the "free" œstriol, and a slight increase in the "free" œstrone. After recovery from the pseudo-labour, the "combined" forms in the urine increased and the "free" forms decreased. True labour was accompanied by changes in œstrin excretion similar to those that had occurred in the pseudo-labour.

The record of Mrs. B. is shown in Fig. 3. Two weeks before parturition she complained of "feeling unwell," and anticipated that she would deliver that evening. During and after this "pseudo-labour" changes in œstrin excretion similar to those observed in that of the case of Mrs. A. occurred. Commencing one week prepartum, the "combined" œstrone and œstriol excretion rapidly decreased and reached a very low level shortly after parturition. The sample of urine collected during labour contained increased amounts of "free" œstrone and œstriol.

Confirmatory evidence that such changes in œstrin excretion are associated with labour was obtained by an examination of a large number of cases of normal pregnancy.

DISCUSSION AND SUMMARY

The first fact of physiological interest which is apparent from the data presented in this paper is that during the greater part of pregnancy over 99 per cent.

† The conditions necessary for the complete hydrolysis of the combined hormones in urine have been slightly modified since the original publication on the colorimetric assay of œstrin in pregnancy urine. The details of this modification will be published elsewhere.

‡ One patient excreted as much as 70 mg. of "combined" œstriol and 3 mg. of "combined" œstrone per twenty-four hours shortly before parturition.

of the total œstrogenic material excreted in the urine is in the "combined" ether-insoluble form, which possesses only a low physiological potency. It is therefore no longer difficult to reconcile the production of large amounts of œstrogenic substances in the body during pregnancy with the fact that the injection of œstrin into pregnant animals may interfere with the normal course of gestation.

Labour, either "true" or "pseudo," is accompanied and may be preceded by (*a*) a fall in the "combined" œstrone and œstriol, and (*b*) a rise in the "free" forms of each excreted in the urine. From the data available at present it is impossible to determine whether these changes are caused by the events that initiate labour, or whether they are themselves factors in the mechanism of parturition.

It is clear from the work of Zondek[5] that the animal body is capable of converting large amounts of administered œstrin into a "combined" form which

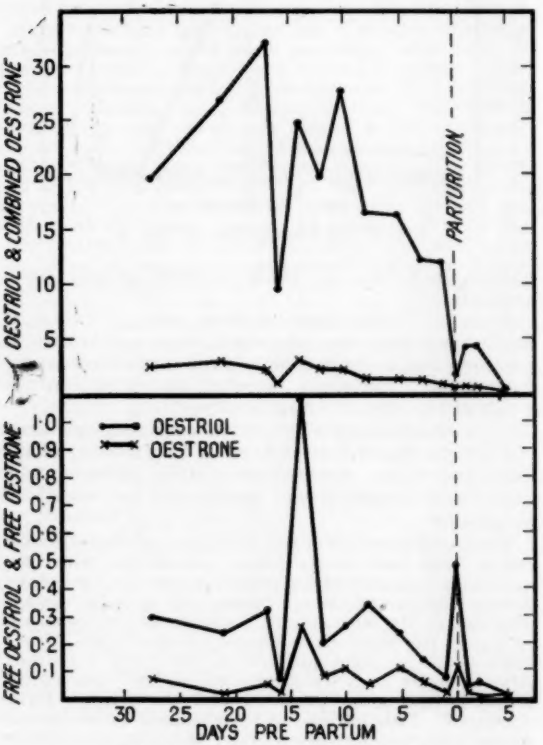

FIG. 3.—Œstrin excretion of Mrs. B.

is physiologically inactive and from which it may be released by acid hydrolysis. The fact that 99 per cent. of the hormone excreted during pregnancy is in such a form suggests that the pregnant woman has the power of similarly inactivating much of the œstrin she produces. It is an attractive hypothesis, and one which could be reconciled with some of the existing theories of parturition, that a factor in the initiation of labour is the production in the body of larger amounts of "free" œstrin of a high physiological potency, either by hydrolysis of the previously formed "combined" hormone, or by some interference with the normal mechanism of inactivation of the hormone after it is produced. The decrease in the amount of total œstrin excreted just prior to and during labour could be explained on the grounds of the utilisation of some of that present in the free state at this period, while the increase in the "free" hormone excreted might be supposed to represent the unutilised excess. Until further information is available, however, such theories are obviously highly speculative in nature.

We wish to express our thanks to the Banting Research Fund for a grant to one of us. (M. W.)

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EMPYEMA COMPLICATING NEW GROWTH OF THE LUNG

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PULMONARY suppuration is well recognised to be a frequent complication of pulmonary new growth. Well recognised certainly by pathologists, for it is the rule rather than the exception to find gross suppurative changes associated with malignant primary growths of the lung post mortem. Clinical conceptions, however, as in other fields, do not always stride as rapidly as pathological ones, and it does not seem to be widely appreciated how dominant the suppurative changes may be in the clinical picture of new growth of the lung. Fishberg and Rubin[1] call attention to this, and consider that about a third of primary neoplasms of the lung break down to leave a cavity: "In all instances of apparently primary abscess of the lung of recent onset in elderly patients the possibility of a broken-down neoplasm must be borne in mind." It is the purpose of this note to draw attention to the comparative frequency with which an apparently primary empyema thoracis dominates the clinical picture of bronchial carcinoma. Maurice Davidson[2] has referred to this, and we would emphasise the importance of viewing with the greatest suspicion the discovery in the chest of the elderly patient of pus which is not traceable to a recent pneumonia.

The diagnosis will usually be made if a careful history is obtained from the patient, particularly with regard to loss of weight and dyspnœa. Pleural pain is, or has been, present in the majority of cases, and there is usually some cough. The patient is not infrequently first seen because of an empyema sinus which has refused to close. In the following illustrative cases an empyema has dominated the clinical findings from an early stage in the development of the disease.

CASE 1.—A. B., aged 57, a motor-driver. He had spent a considerable time abroad in Africa, where he had contracted enteric fever, dysentery, and malaria. He was admitted to hospital in October, 1933. He stated that he had had an attack of right-sided "pleurisy" one year before, from which he had recovered; the illness had consisted of a short attack of pain in the right side of the chest, when a friction rub was apparently detected.

On admission he was complaining of pain in the right chest, of a month's duration, and marked loss of weight, with very slight cough and sputum. The patient was a thin

man of poor nutrition. The right chest showed marked collapse, especially at the base, percussion note was much impaired, and the breath sounds at the base were bronchial. The liver edge was palpable 3 in. below the costal margin, but the surface was smooth and not tender. There was slight tachycardia, but no pyrexia. The sputum was persistently negative for tubercle, and the Wassermann was also negative. The right base was aspirated and thick pus obtained, which on culture grew staphylococci only. A radiogram of the chest showed an area of dense shadowing in the lower third of the right chest, with some loss of translucency extending to the apex. A resection of the eighth rib was performed under Evipan anæsthesia and about a pint of pus removed. The wound gradually became dry and the drainage-tube was removed three weeks later. After the operation the general condition of the patient improved somewhat, but a fortnight after the removal of the tube his condition began to deteriorate, and he ran for the first time a swinging temperature. Pus was again obtained from the right chest on exploration, and despite the poor condition of the patient, the old wound was opened up. There was little pus and no definable pleural cavity, necrotic lung being adherent to the chest wall. The patient died a week later.

At post-mortem examination a primary bronchial carcinoma of the right main bronchus was found, causing a complete bronchial block. No secondaries were found elsewhere on the body. The liver was very much ptosed and showed fatty change only.

CASE 2.—C. D., aged 49, a carpenter, was admitted to hospital in April, 1934. He gave six months' history of breathlessness and slight cough, with occasional pains in the left chest. He had had a rib resection performed of the left chest two months previously for an empyema at another hospital. This had had the effect of improving his general condition and easing his cough. He was admitted now because the empyema sinus had refused to close. On examination emaciation was severe, he was very dyspnœic, and was running a swinging temperature. The whole of the left chest showed collapse, with absence of diaphragmatic movement on the affected side. The trachea deviated to the left, and there was complete dullness and absent breath sounds. The liver was enlarged to the umbilicus, and was hard and nodular. A chest X ray showed an opaque left chest, with collapse of the lung and deviation of the mediastinal structures to that side. A bronchography was performed, using lipiodol, by the transglottic route, and demonstrated a complete stenosis of the left main bronchus, immediately distal to the tracheal bifurcation. A diagnosis was made of primary bronchial carcinoma of the left main bronchus, with secondary pleural infection and metastases in the liver. The patient died in June, 1934, and the diagnosis confirmed by autopsy.

CASE 3.—Mrs. E. F., aged 55, gave a history of cough and dyspnœa of five weeks' duration, and stated that she had had an attack of "pleurisy" five months previously. On examination the clinical findings were those of a right-sided pleural effusion. The patient looked ill, and was running a low-grade pyrexia. The sputum was repeatedly negative for tubercle. Direct X ray examination showed an opaque right chest, with some collapse. Exploration of the right pleural cavity revealed thick pneumococcal pus in large quantities. In view of her age and the absence of a history suggesting pneumonia, a bronchography was performed; this demonstrated a bronchial block 1 in. distal to the tracheal bifurcation on the right side. In view of these findings and the general condition of the patient, no radical treatment of the empyema was undertaken.

She died two months later, and post-mortem examination confirmed the diagnosis of bronchial carcinoma, with pulmonary collapse and secondary pleural infection.

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MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF OBSTETRICS AND GYNÆCOLOGY

A MEETING of this section was held on March 15th, with Mr. EARDLEY HOLLAND, the president, in the chair.

Irradiation and Pregnancy

Miss MARGARET BASDEN described a case of obstructed labour due to radium stenosis of the cervix. None of those concerned, she said, had any idea that the patient had suffered from carcinoma of the cervix or had received radium treatment; apparently she regarded these incidents as too trivial to mention.

She was a multipara aged 35, and had six normal labours; there had also been two miscarriages, but none since the birth of the last child four years ago. The radium treatment had been given two years before the present confinement. When the patient was admitted to hospita there was a history of a shoulder presentation; the membranes had ruptured two days previously; the cervix admitted one finger only, and was not taken up; and the child was dead. After unsuccessful attempts at external version and later at bringing down a leg, a small bag was inserted, and the patient was left for the rest of the night (the manipulations did not cause bleeding). But the size of the os remained the same, and next afternoon Cæsarean hysterectomy was performed. Seven months later a small recurrence of the original malignant growth was noted in the cervical stump; she was admitted to the Marie Curie Hospital for further radium treatment, and at present seemed free from disease.

Dr. ELIZABETH HURDON said that the total dose given in this case was 1200 mg.-hours, and it kept the cancer quiescent three years. Amenorrhœa continued for a year after the irradiation, and menstruation was then regular until conception occurred in July, 1933. The pregnancy went on normally until term. A search had revealed only 12 reported cases of conception after irradiation for cancer of the cervix. Where the cancer complicated pregnancy it was usually discovered early, the radium dose was small, and none was placed in the body of the uterus. Most of the patients were very young women. The most important deformity attributed to irradiation was microcephalic idiocy, but it was doubtful if this ever followed irradiation of the cervix before conception. Murphy had analysed 519 cases of pregnancy following irradiation, and found that 402 went to full term, while 4 were stillborn; there was an infant mortality of 13. Twenty per cent. of the patients had abortions or premature deliveries. Apparently the effect of preconceptional irradiation on the child was negligible. Of the mothers, a number —especially those previously treated for cancer of the cervix—had died from hæmorrhage during parturition, while obstructed labour due to stenosis of the cervix had followed radiotherapy for menorrhagia as well as for cancer. In treating menorrhagia at the Marie Curie Hospital, efforts were made to avoid such injury by placing all the radium in the body of the uterus. Dr. Hurdon submitted that when pregnancy follows irradiation for cervical cancer, delivery should always be by Cæsarean section. After preconception irradiation for hæmorrhage, fibroids, or sterilisation, pregnancy and parturition were usually normal, but Cæsarean section should be performed if a stenosed fibrotic cervix was likely to cause obstruction. There was no evidence that preconception radiotherapy affected the child;

radiotherapy was not a thoroughly reliable method of inducing sterility.

Mr. L. CARNAC RIVETT said he had never seen pregnancy following irradiation for carcinoma of the cervix. In 1913 Sir Comyns Berkeley had a patient who, 28 weeks after pregnancy began, revealed a carcinoma of the cervix; he gave two doses of radium at intervals of three weeks, and just before term he performed a Cæsarean Wertheim operation. The baby lived and had two very bald spots on the head, presumably where the radium was applied. When Mr. Rivett saw her 25 years later she was thoroughly healthy and had no bald patch.

Mr. CHASSAR MOIR said it seemed to be established that if a woman was irradiated during pregnancy, especially by X rays, there was a chance that the child would be a microcephalic idiot, or have some other abnormality. If the child was irradiated late in pregnancy it might escape deformity; radium applications might be so localised that the viable parts were too far away to be influenced. In the former kind of case, abortion should be induced. A more important question was whether irradiation had any effect on future offspring. At one stage there was a chance of the ovum being unhealthy but still fertilisable. Experiments on animals mostly showed that irradiation caused some damage to the succeeding offspring, and very much greater damage to the second generation. He considered it unjustifiable to treat bleeding in a young girl by radium applications, since these might cause sterility.

Childbirth in a Chimpanzee

Mr. JAMES WYATT gave an account, illustrated by lantern slides, of his assistance at the recent birth of a chimpanzee at the London "Zoo."

The mother, he said, was 12 years old, and previous attempts at mating had been unproductive. On this occasion conception had occurred soon after a fresh male had been introduced and must have commenced between the seventh and the seventeenth days of the menstrual cycle. When it was clear that implantation had occurred, calcium sodium lactate was given. When the breasts began to enlarge, the chimpanzee began to pull upon her own nipples. Abdominal enlargement was noted from the fifth month. An hour after the commencement of labour pains a discharge of blood-stained mucus was seen, and the pains became acute at intervals of 7–10 minutes. At the moment of birth the mother pulled the infant out with her hands, and when she caught her first glimpse of it she was obviously frightened, and retired from it. Then the infant began to whimper, and immediately the mother approached it and gathered it into her arms, and carried it in this way to a shelf and turned towards the wall, with, apparently, great content. The mother was considerably worried by her obstruction by the umbilical cord, which she several times attempted to pull away, but failed. After 30 hours the keeper removed a large blood clot from the vagina, and immediately afterwards the placenta came away. Though it had been in situ for such a long time it presented no sign of decomposition.

The mother's bowels did not act for two days after the birth, at which event the temperature was 99·5° F. Syrup of figs was given without effect, and a few hours later the keeper administered an enema; this produced a very copious motion, and she had been normal ever since. The breasts did not properly fill until seven days after the birth. As the animal seemed satisfied with the mother's milk, no attempt was made to supplement it. Analysis of the mother's milk closely approached that of the human—i.e., 88 per cent. of water, 3·75 per cent. of fat (this was highest on the third day), 2·1 per cent. to 3·1 per cent. protein, lactose, at first 5·73, later 7 per cent.

The attitude the chimpanzee assumed shortly before the onset of its pains was on all fours, with a tilting downwards towards the hindquarters, much like that adopted by native African women under the same conditions. The fact that the use of the hand in attempts to get away the cord did not produce any sepsis seemed to suggest that there was less danger of transfer of infection from anus to vagina than in the human subject.

Hydatidiform Mole and Chorion-carcinoma

Mr. ALAN BREWS read a paper based on 72 consecutive cases of hydatidiform mole and 16 of chorion-epithelioma in the London Hospital since 1912. Some of the cases of mole subsequently developed chorion-epithelioma, and those were included among the latter. Only one case bore on the ætiology of the condition. It was one in which the patient had a twin pregnancy consisting of a normal placenta and fœtus, and also of a hydatidiform mole; this suggested that the cause lay in the ovum, and not in some hormonic or other defect in the mother. The condition could occur at almost any stage of the childbearing period, but was relatively commoner in pregnancies after 40 years of age; indeed 37 per cent. of these cases were in women over 40. Seventeen of the patients had hydatidiform mole as their first pregnancy, and 39 were multigravidæ, with any number of children from one to ten.

The presenting symptom was some form of abnormal uterine hæmorrhage in 59 of the cases. The remaining 13 cases were admitted for various reasons—e.g., severe vomiting (4), abdominal pain (3), swelling of the feet, headaches, or abdominal enlargement. In 10 per cent. the uterine hæmorrhage was not preceded by amenorrhœa, so that a diagnosis of pregnancy even of an abnormal type was very difficult. A period of 1–3 months' amenorrhœa was noted in 60 per cent. of the cases and 3–9 months in 11 per cent., while one or two of the older patients had more than a year without menstruation. In order to decide when the pregnancies started, Mr. Brews had added together the periods of amenorrhœa and bleeding. He found that in 65 per cent. of the cases the uterus was larger than would have been expected judging from the probable duration of the pregnancy; in 14 per cent. it was of the correct size, and in 21 per cent. it was smaller. Thus in 1 case out of 5 in this series the uterus was unexpectedly small, differing from the text-book description of this disease, where it is always alleged to be abnormally large. The urine in the cases investigated was not tested as often as it should have been, partly because they were often dealt with as emergencies and partly because the patients were bleeding; but in 12 out of 34 in which examination was recorded it contained albumin.

Dealing with differential diagnosis, Mr. Brews said that in 40 cases the diagnosis was some type of abortion. In a few advanced cases it was thought to be placenta prævia. If there had been no period of amenorrhœa it was called menorrhagia. The point of greatest interest was that in 9 of the 72 cases the original diagnosis was some form of pelvic tumour. The most common error was to attribute the condition to ovarian or uterine tumour, but in one case there were in fact large bilateral multilocular lutein cysts of the ovaries as well as a mole.

In treatment the somewhat conservative method of manual expression or digital removal through the vagina was adopted in 27 cases; 9 got rid of the mole without aid, and in 8 abortion was induced. In one case a small bag was introduced, and in one vaginal hysterotomy was carried out. In the whole series there was only one death which could be called primary; this was in a woman aged 36, who came into hospital after eight weeks of bleeding, culminating in a huge hæmorrhage, and was moribund when

admitted. Findlay, on the other hand, reported 28 deaths in 265 cases of benign mole. A third of the 72 cases were afebrile; 17 had fever to a degree not exceeding the minimum puerperal morbidity; 19 had moderate pyrexia, lasting on the average 14 days; 2 had clinical pyæmia; 4 had clinical septicæmia.

Six of the patients were treated primarily by hysterectomy, and one died before the mole was expelled. This left 65 of the 72. Ten of these developed abnormal uterine hæmorrhage within a few weeks of the expulsion of the mole, and in each case the uterus was explored or re-explored. Chorion-epithelioma was reported in 6 cases and in these a secondary pan-hysterectomy was done within a short time. In 4 of these cases definite infiltrating chorion-epithelioma was found in the uterus removed. In the other 2, in spite of the apparent malignant nature of the curettage, no growth was found in the uterus after its removal. Two other cases of secondary chorion-epithelioma occurred but did not develop secondary abnormal uterine bleeding. One was that of a woman aged 45, who had had four children. She passed a mole and was readmitted afterwards for curettage. This latter was negative, no further bleeding occurred, and subsequently she had normal regular periods. Nevertheless she developed chorion-epithelioma eight months after the original mole and died of secondary growth in the brain. It proved impossible to trace 17 of the cases, but of 40 treated conservatively (i.e., not by primary or secondary hysterectomy) and followed up, 1 only developed chorion-epithelioma: the remaining 39 remained well, and 17 of them who had subsequently become pregnant had had among them 37 children. There had been no case of recurrence of a further hydatidiform mole.

Pregnancy tests were valuable in the diagnosis and prognosis of these cases, but they must not be regarded as more than adjuncts to clinical diagnosis.

In the discussion, Mr. W. GILLIATT said the teaching was that lutein cyst complicating hydatidiform mole disappeared spontaneously.—Dr. G. W. THEOBALD suggested that after hydatidiform mole curettage should be carried out at the end of the first week, and again a week later, in the hope of preventing the formation of chorion-epithelioma.

SECTION OF PHYSICAL MEDICINE

Dr. J. B. BURT took the chair at a meeting of this section held on March 15th, and Prof. E. W. HEY GROVES opened a discussion on the

Treatment of Injuries

The scientific principles on which the treatment of injuries is founded had, he said, undergone little change during the last generation. Its results, however, were immeasurably better, and the improvement depended, not upon the principles of treatment, but upon their correct application and upon the organisation of the treatment unit. Granted that the fundamentals of treatment were carried out honestly and efficiently, the main factor was organisation; this consisted of three requirements—unity of control, continuity of treatment, and accurate follow-up. He quoted evidence from the findings of the Fracture Committee of the British Medical Association, and showed a table which demonstrated complete disproportion between results obtained at organised fracture clinics and elsewhere. He pointed out that the disproportion was even greater in the case of injuries, such as Colles's and Pott's fractures, which were often treated in the out-patient department. In a hospital without an organised fracture service the patient was often passed on from department to department or transferred to another hospital, and suffered more from discontinuity of treatment than did the in-patient.

Prof. Hey Groves, in another chart, showed the high cost of treatment at unorganised Austrian hospitals compared with the low cost at Böhler's clinic. The actual amount of money saved on the treatment of fractures alone was, he said, practically the same as the total cost of the whole hospital every year. He then considered a number of individual cases to show how treatment was prolonged and disability rendered permanent by lack of organisation. A simple example was that of a patient with a Pott's fracture who came to out-patients on Saturday night when X rays were not available and was sent home on a back-splint and told to report on Monday; he had then been too ill, and had stayed at home for four weeks and suffered a permanent disability. Prof. Hey Groves gave other examples and in conclusion he pointed out that although the principles of treatment had been spoken of in season and out of season, nothing had been done. One reason was financial: the voluntary hospital did not wish to increase its liabilities and the junior staff would not enter a specialty which promised no return. Large sums of money at present wasted could be spent on organising fracture units in connexion with the existing voluntary hospital. For £1000 a year a unit could employ the whole-time medical and clerical assistance which would enable it to produce improvement in results.

Dr. C. B. HEALD considered that, in addition to the three main causes of delayed recovery given in the Fracture Committee's report, two others existed: failure to recognise (1) the part played by soft tissues, and (2) factors in the general health of the patient. Specialists in physical medicine constantly met patients who, from lack of timely attention to some constitutional defect or toxic focus, had developed residual pains and weaknesses around the site of an old injury. These residual conditions were too often called rheumatism or arthritis. He drew attention to what he called the amazing statement in the report that massage and electrical stimulation had been largely misapplied and that active use of the part should, wherever possible, replace them. If electrical stimulation had been misapplied, he declared, it had been by the direct instructions of the surgeon to the technician, without the advice of the qualified electrotherapist. The Committee were obviously ignorant of the use of electricity as a sedative and antispasmodic, as in the form of weak anodal galvanism. He showed some figures of very favourable results from the treatment of fractures by electrical methods. Böhler, giving residential treatment, reposition, and immobilisation, and encouraging voluntary use as far as possible, had interested insurance companies and large organisations in the saving that could be effected by intensive attack in cases of injury, and his results had rightly awakened the interest of surgeons to the value of physical methods. If fractures, especially ambulatory ones, could be treated in this country by electrical methods and hospital residence, the end-results would compare favourably with those of Böhler's clinic. Dr. Heald outlined his scheme for a fracture clinic, which was partly developed and running well at the Royal Free Hospital. He had, he said, removed physical treatment and its staff from the subordinate position given to it in the Fracture Committee's report, and had changed the atmosphere of the "dictator"

to one of collaboration and team-work. His proposals did not in the least upset the essentials for success laid down in the report: segregation, continuity of supervision, after-care, and unity of control.

Dr. HAROLD MOORE described his results in the treatment of long-standing injuries in railwaymen who had been given up by other clinics after faulty and ineffective treatment. Each case was individually handled from start to finish under close medical supervision, and was given continuous treatment by persons interested in getting the best results in the quickest time. The majority of the patients were totally incapacitated with no prospect of improvement unless intensively treated. Out of his first 432 patients 323, or 74 per cent., had been returned to their work after an average of 17 days' treatment, though their average period of disability had been seven months. His figures, he said, showed what a large amount of recoverable wastage existed, how little of this should occur with proper treatment, and the great possibility of cure even after long periods of incapacity. The keynote of his methods was, he said, to impress on the patient that his cure depended on himself, and to make him carry out simple exercises for many hours at a time under close individual supervision and continual encouragement. Massage and passive treatment could only be regarded as an aid and a preliminary to coöperative activity.

Dr. JAMES MENNELL reiterated the doctrines of Lucas-Championnière that the minor degrees of injury should not be treated as though they were serious; splinting should not be employed unnecessarily, and massage was purely a means towards the restoration of function, which came from within the patient and not from the masseur's hand. The scathing remarks in the report about physical treatment were justified in so far as this treatment had been abused. Physiotherapists must continue to demonstrate that their methods were an essential part of the treatment of injuries. As far as rehabilitation was concerned, physical treatment had let itself down. Medical men were ignorant of what physiotherapists could do if their efforts were directed aright. So long as the treatment of injuries remained in the hands of the surgeon only, improvement would be delayed. Members of the section should see that the abuse of physical treatment was wiped out and its use proved; if they did this, a subsequent report would give a prominent place to their methods.

Mr. ROCK CARLING assured the section that no member of the Fracture Committee had had the slightest intention to insult physiotherapists or even to neglect their excellent work. He reproached Dr. Heald for not providing the Fracture Committee with the figures he had shown at the meeting. One reason for the comparative success of in-patient treatment was, he said, that the patient in the wards was protected from the adverse psychological influence of his trade-union secretary, touting lawyers, and anxious friends. The patient was fortunate who, after injury, fell into the hands of a good general practitioner who would, throughout the whole treatment, keep both his physical and his psychical interest in the case.

Dr. PHILIP HAMILL laid stress on the maintenance of the nutrition and function of the muscles when their nerve-supply had been impaired. He showed a short film illustrating the great help given by Prostigmin in restoring the power of voluntary movement for a few hours, during which the patient could exercise the muscles actively. Half a crown expended on the drug could, he said, give at least the benefit of half a guinea's worth of massage.

The PRESIDENT, in closing the discussion, pointed out the invaluable investment which the physical treatment clinic represented to the insurance company.

SECTION OF PSYCHIATRY

A MEETING of this section was held on March 12th, when Dr. MURDO MACKENZIE read a paper on

C. G. Jung: His Contribution to Clinical Psychiatry

Dr. Mackenzie considered first the method by which Jung had presented his views. He had gone for his evidence to the history of thought rather than to clinical medicine and psychiatry. In elaborating his conception of psychological types Jung had instanced such men as Tertullian, the introvert, and Origen, the extravert, and had made reference to the *sacrificium aut intellectus aut phalli*. Doctors might ask whether an understanding of neurosis could be arrived at by such comparison of individuals, whether of the present time or the past. From Jung's examples one saw how useless it was to try to subdivide thought. For practical purposes his early limitation of the terms "introversion" and "extraversion" should be maintained. Instead of using the complicated terminology of psychologists with such words as subjectivity and objectivity, psychiatrists would prefer to say simply that some try to denude their knowledge, others to organise it. In tracing the correspondence between Goethe and Schiller, Jung had made clear the fact that such different types of thinking need not clash; they might be complementary. In the individual one might, however, find a conflict between deconcretised and concretised thought. In Nietzsche one found a further elaboration of thought, and considering that he too, like Schiller, was an introvert, one arrived at a differentiation according to feeling, intuition, sensation, and thinking, which Jung called basic functions. The types quoted by Jung from the descriptions of Jordan lent themselves to psychiatric classification as hysterics, hypomanics, depressives, and obsessionals. The speed of reaction was an important criterion; there might be the immediate, social type and the logical, deliberate one. To the former group might be added the qualification "civilising," and to the latter "cultural"; this would be associated with the contracted or the shallow consciousness, found in these types by Otto Gross. In the study of hysteria, Janet had made somnambulism the focal point, whereas for Charcot the fit had been the centre of interest. In the hysteric one had the immediate response, in the obsessional the deliberate response. Both concretised thinking types and deconcretised ones might be subdivided according to speed of reaction. So one arrived at a fourfold discrimination into which fitted the hysteric, the obsessional, the depressive, and the aggressive. As the introvert passed from aggression to defence, his ego struggled against the terrifying aspect of the concrete. Treatment of the depressive or psychosthenic depended on the possibility of removing this situation. This was the type which Jung had described better than any other; it probably constituted his main contribution to clinical psychiatry. Dr. Mackenzie concluded by pointing out the distinction between Jung's philosophical work and that part of his studies which could be applied in clinical psychiatry with profit.

DISCUSSION AND REPLY

Dr. H. G. BAYNES said he had missed any reference to the relation between subject and object, which

knitted together the contrasting principles in extraversion and introversion. In his earlier work, "Psychology of the Unconscious," Jung had used certain mythological motives to bring out the content of the material; it was in the same relation to the work on types as the roots of a tree were to its differentiated surface. In that earlier work he had considered movements of libido: if it moved backward, at one of the nodal points, then there was a possibility of neurotic manifestation. Jung's intention had not at first been a therapeutic one, nor his interest primarily clinical in this field.

Dr. E. A. BENNET also pointed out that it was not Jung's intention to describe neurosis, but to describe the psyche. He had proceeded from within outward, whereas in Kretschmer's, Rohrschoch's, and other methods the opposite was true. Dr. Mackenzie too had proceeded from without inwards. As regards the four basic functions, it must be recognised that there was almost no limit to the subdivision of these —e.g., of thinking as logical, speculative, &c. He asked what were Dr. Mackenzie's views as to the possibility of the depressive being really an extravert?

Dr. DORIS ODLUM suggested that the alternation from mania to melancholia in the same person might represent a change of potential in the libido.

Dr. MACKENZIE said, in reply, that he had been solely concerned with the value of Jung's work to the practising physician. Jung had clearly laid great emphasis on the thinking introvert. The depressed person always feared the concrete. Application of Jung's theories could be very helpful in treating such patients.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION

AT a meeting of this association held on Feb. 26th at B.M.A. House, Dr. E. PICKARD, the president, in the chair, a paper on

Tissue Culture and the Study of Skeletal Development

was read by Miss HONOR FELL, D.Sc., of the Strangeways Research Laboratory at Cambridge. She said that tissue culture technique was really established by Ross Harrison in his classical experiments on nerve outgrowth in the frog, and was adapted for the cultivation of tissues from warm-blooded animals by Burrows and Carrel. Tissue culture consisted essentially in removing a small fragment of tissue from the body and explanting it in a small quantity of nutritive medium in a suitable glass vessel. The best culture medium was a semi-solid clot formed by a mixture of blood plasma and saline extract of embryonic juices. The cultures were periodically transferred to fresh medium and incubated at body temperature. Strict asepsis had to be observed in all manipulations. Tissues cultivated in vitro showed two types of growth termed respectively "somatic" and "uncontrolled." In somatic growth, said Dr. Fell, the explanted fragment grows and develops almost as if it were still part of the body, and it was with this type of growth that her remarks were concerned. Uncontrolled growth was characterised by a progressive simplification of the original histological structure correlated with a diffuse outgrowth of the cells into the medium. The problems of skeletal development fell into two main groups: (*a*) histogenetic problems relating to the differentiation of skeletal tissues and (*b*) anatomical problems relating to the differentiation of gross skeletal form. Tissue culture had contributed to the solution of both (*a*) and (*b*). Dr. Fell dealt first with histogenetic problems; one of these concerned the relative importance of extrinsic and intrinsic factors in the primary development of cartilage in the early embryo. Fragments of the undifferentiated chondrogenic tissue from the limb-bud and jaw of 3–4 day fowl embryos, when cultivated in vitro, readily formed cartilage in the complete absence of a nerve and vascular system and of the normally associated muscle. Similar explants of undifferentiated tissue from non-chondrogenic areas failed to form cartilage. These results afforded evidence that in embryonic development cartilage differentiates as a result of factors intrinsic in the cells and not in response to environmental influence. Another problem of histogenesis on which tissue culture shed considerable light was the much vexed question of the nature and function of the osteoblast. The osteoblast was now sometimes regarded simply as an active fibroblast and not as a cell specifically differentiated for bone-formation, whilst bone-formation was thought to be caused merely by the presence of excess calcium in a young and highly vascular connective tissue. It therefore seemed important to discover whether osteoblasts could form bone when removed from the body and grown under the standardised conditions obtainable in vitro. Osteogenic tissue from three different sources—viz., the jaw rudiment, periosteum, and endosteum—was therefore cultivated. These cultures readily formed bone, but similar cultures of fibroblasts never ossified. From this it was concluded (*a*) that the osteoblasts are directly concerned with bone development, and (*b*) that there is an essential physiological difference between the osteoblast and the fibroblast.

Dr. Fell then considered the importance of tissue culture in the study of anatomical problems with special reference to the question of joint-formation. Joint-formation involved two main problems: (*a*) whether the characteristic shape of the articular ends is due to extrinsic or intrinsic factors, and (*b*) how two opposing bone rudiments developing from a common block of mesoderm are able to separate and form two movable, independent units instead of developing in continuity. If the early femur rudiment of the fowl was removed from the body and cultivated in vitro it developed a remarkably normal anatomical form with condyles, head, and trochanter. This result confirmed P. D. F. Murray's view that the general form of the bone is determined by intrinsic factors. In order to study the mode of separation of adjacent articular surfaces, the Y-shaped condensation of mesoderm representing the rudiment of the limb skeleton was removed from the limb-bud of the embryonic fowl and cultivated in vitro. Such explants formed a femur separated by a well-marked joint from the tibia and fibula. The joint did not persist in vitro, but disappeared by secondary fusion. These results showed that the earlier stages of joint-formation can proceed in the absence of muscular action and of a nerve and blood-supply. A further series of experiments on the explanted skeletal rudiment of the leg were described, as a result of which it was concluded that the separation of the articular surfaces is the mechanical result of differential growth, although the characteristic shape of the knee-joint is intrinsic in the limb-mosaic.

After the lecture a cinema film, photographed by Dr. R. G. CANTI, was shown, in which the development in vitro of the isolated femur rudiment and of the knee-joint was demonstrated.

REVIEWS AND NOTICES OF BOOKS

Diseases of Children

Edited by Sir A. E. GARROD, D.M., F.R.S., the late FREDERICK E. BATTEN, M.D., F.R.C.P., and HUGH THURSFIELD, D.M., F.R.C.P. Third edition with contributions by 36 authors. Edited by HUGH THURSFIELD, D.M. Oxon., F.R.C.P., Physician, Hospital for Sick Children, Great Ormond-street; Consulting Physician, St. Bartholomew's Hospital; and DONALD PATERSON, M.D. Edin., F.R.C.P., Physician to Out-patients, Hospital for Sick Children, Great Ormond-street; Physician in Charge of Diseases of Children, Westminster Hospital. London: Edward Arnold and Co., Ltd. 1935. Pp. 1152. 50*s*.

THE appearance of the third edition of this well-known text-book has provided the occasion for a very thorough revision and the complete re-writing of many of the sections. The volume opens appropriately with a short review of the principles of heredity in relation to morbid processes; this is followed by a discussion of immunity, in which section is included, rather surprisingly, a description of one method of blood transfusion. The latter might well have formed part of a considerably larger section devoted to the technique of special methods of diagnosis and treatment of disease in childhood. Descriptions of several diseases are included for the first time in the present edition, and the section on tuberculosis, which provides a singularly clear outline of the modern views of infection in childhood, has been brought into line with recent work on the subject. There is necessarily a certain unevenness, and in one or two places out-of-date material has been retained. The reader cannot fail to be impressed, however, with the economy of presentation, and with the comprehensive way in which each subject is discussed. The dragooning of thirty-six contributors (even when most of them are attached to the same hospital) is no easy task, and the editors are to be congratulated on the production of a symposium which maintains such a high level of scholarship throughout, and in which there is a minimum of overlapping. We are glad to see that the one-volume format has been retained, which is of great convenience in rapid reference, and that opportunity has been taken to improve the index, which was one of the least satisfactory features of the last edition. The illustrations, with the exception of some of the chest X rays, are well reproduced, and the references to the literature are well chosen and numerous.

The volume as a whole is one of real distinction, which cannot but add to the reputation of English pædiatrics and to the popularity which this work has enjoyed since the appearance of the original "Garrod, Batten, and Thursfield."

Amebiasis and Amebic Dysentery

By CHARLES F. CRAIG, M.D., Colonel U.S. Army, Retired, D.S.M., Professor of Tropical Medicine and Head of the Department of Tropical Medicine, School of Medicine, Tulane University, New Orleans. London: Baillière, Tindall and Cox. 1935. Pp. 315. 22*s*. 6*d*.

Colonel Craig has long contemplated the preparation of a book on amœbiasis, a subject on which he is an authority, and was spurred to decisive action by the unexpected outbreak of this disease in Chicago in 1933. The subject matter is well presented, the chapters on ætiology, epidemiology, and pathology being particularly praiseworthy. Nothing of importance appears to have been omitted, and this is no mean task considering the range of the subject and the vast amount of literature that had to be consulted. The account of the symptomatology is not perhaps quite so clear as is the rest of the subject matter, but the complications and sequelæ are admirably set out; the list of the clinical states to which liver abscess may give rise seems almost endless. Differential diagnosis receives more detailed attention than in any other work with which we are acquainted. The practical method of concentration of the fæces for the cysts of *Entamœba histolytica* described on p. 200 will be welcomed by many workers. To the complement-fixation test for the diagnosis of amœbiasis Colonel Craig attributes a high degree of specificity and therefore a considerable diagnostic value. The technique employed is practically the same as that used in the complement-fixation test for syphilis in the United States Army laboratories, and the antigen is obtained from alcoholic extracts of *E. histolytica* grown upon a modified Boeck-Drbohlav medium. The results obtained by Craig in 1000 cases tested and checked by stool examinations are given: 17·5 per cent. gave a positive and 82·5 per cent. a negative result. Among the negative group *E. histolytica* parasites were found by subsequent examination of the fæces in 1·4 per cent.

In the chapter on treatment the author discusses all the methods in general use, but the issue remains complicated by the varied nature of the drugs employed. The practitioner's mind would be cleared by a more critical analysis of the final results of such treatments or some personal statement of opinion of their permanent value. In other respects the book is one of the best summaries of amœbiasis in all its aspects that we have come across.

A Manual of Obstetrical and Gynæcological Pathology

By JOHN H. TEACHER, M.D., late St. Mungo Professor of Pathology, University of Glasgow. Edited by ALICE J. MARSHALL, M.B. London: Humphrey Milford, Oxford University Press. 1935. Pp. 407. 45*s*.

FOR many years Prof. Teacher had contemplated writing a manual of obstetrical and gynæcological pathology and he had actually got some way with it before his death. It is a matter of regret that he did not live to complete the work. Fortunately he finished the eight chapters devoted to the pathology of the endometrium and the changes therein in pregnancy, which represent, in his own words, the results of thirty years' wrestling with the task of interpreting the problems presented by this tissue. In the description of the menstrual changes is included a lucid and fair presentation of that most difficult question, the relation of the ovarian and menstrual cycles. From his extensive and careful observations he is unable to agree that ovulation occurs with unfailing regularity every month. As a pathologist he found that ripe Graafian follicles and corpora lutea were far more rare, both in operation material and at post-mortem examination, than they should have been if what he regarded as the orthodox views were correct.

Holding that the term "endometritis" should be used only in the sense of inflammation of the endometrium, the author declares that such a condition is rarely encountered by the pathologist, when those cases are excluded that are clearly related to conception. The changes that take place in the implantation and early development of the ovum are beautifully described from the two Teacher-Brice specimens. Teacher held the view that there is no difference between the decidual membrane of pregnancy in a very early stage and the so-called premenstrual or progestational decidua. He gives here a full account, taking up 60 pages, of the structure and pathology of the decidua and placenta; apart from a suggested classification for infarcts of the placenta, he is unable to bring forward much further information as to the cause, and states that the ætiology of this infarction is the problem of thrombosis anywhere else in the body. The section devoted to the changes that occur in the involution of the gravid uterus contains an account of the pathology of puerperal infection, and in this respect it is interesting to note that Teacher had seen many instances in which salpingitis or a tubo-ovarian abscess had followed puerperal or post-abortive sepsis.

The remaining chapters have been contributed by Prof. Fletcher Shaw (pathology of the myometrium), Prof. Matthew Stewart (endometriosis), Prof. Gilbert Strachan (tumours of the uterus, including an excellent account of endometriosis), Prof. James Hendry (ectopic pregnancy and pathology of the vagina and vulva), Dr. Elinor Rutherford (physiology and pathology of the ovary), Dr. Alice Marshall (Fallopian tube), and lastly Dr. Robert Cruikshank, who, in a chapter on the bacteriology of the female genital tract, has presented a comprehensive account of this subject. There are over three hundred illustrations; nearly all are microphotographs, most of them excellent.

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1. The 1934 Year Book of General Medicine

Edited by GEORGE F. DICK, M.D., LAWRASON BROWN, M.D., GEORGE R. MINOT, M.D., S.D., F.R.C.P.(Hon.) Edin., WILLIAM B. CASTLE, M.D., A.M., WILLIAM B. STROUD, M.D., and GEORGE B. EUSTERMAN, M.D. Chicago: The Year Book Publishers (Inc.); London: H. K. Lewis and Co., Ltd. 1935. Pp. 843. 12*s.* 6*d.*

2. The 1934 Year Book of the Eye, Ear, Nose, and Throat

The Eye. By E. V. L. BROWN, M.D., Professor of Ophthalmology; LOUIS BOTHMAN, M.D., Associate Professor of Ophthalmology. *Ear, Nose, and Throat.* By GEORGE E. SHAMBAUGH, M.D., Professor of Otolaryngology; and ELMER W. HAGENS, M.D., Assistant Clinical Professor of Otolaryngology. With the collaboration of GEORGE E. SHAMBAUGH, Jr., M.D., Clinical Assistant in Otolaryngology, University of Chicago. Same publishers. 1935. Pp. 621. 10*s.* 6*d.*

1. THIS book is divided into five sections. The first, edited by Dr. Dick, deals with infectious diseases, with special reference to therapy. Part II., edited by Dr. Brown, concerns diseases of the chest, excepting the heart; the increasing diagnostic and prognostic value of radiology in chest conditions is emphasised. Part III., edited by Drs. Minot and Castle, comprises diseases of the blood and blood-forming organs, and also diseases of the kidney. The modern classification and treatment of the anæmias is, perhaps, as practically valuable as anything in the book. Diseases of the heart and blood-vessels, edited by Dr. Stroud, are considered in Part IV., and the last section, edited by Dr. Eusterman, deals with diseases of the digestive tract and of metabolism. The fact that papers by more than 750 authors of various nationalities are here summarised and commented upon gives some idea of the immense labour and care taken to produce this book and to make it as comprehensive as possible. The growing tendency, especially among American workers, to rush into print on too little evidence is manifest in some of the work quoted, but the editorial comments throughout are shrewd, balanced, and authoritative. The account of the work done with alum-precipitated diphtheria toxoid is of special topical interest. Practitioners anxious to keep abreast of modern developments in diagnostic method and therapeutics are advised to get this book.

2. We welcome the new volume of this excellent annual from the hands of the same authors who prepared its predecessors. As before, it consists of abstracts from the literature of these specialties, culled from world-wide sources, chosen with discretion and summarised with great skill. The shrewd editorial comments appended to many of the articles are a valuable feature of the book. Notable sections in this year's publication include a further account of Arthur B. Duel's important work on the treatment of facial paralysis, a study by A. W. Proetz of the effects of certain drugs on living nasal ciliated epithelium, several articles on desensitisation in hay-fever and allied allergic conditions, and a series of valuable papers on carcinoma of the larynx. There is a good index both of subjects and of authors.

Dental Pharmacology and Therapeutics

By J. R. BLAYNEY, B.S., D.D.S., M.S., Professor of Dental Pathology and Therapeutics, University of Illinois, College of Dentistry. London: Henry Kimpton. 1934. Pp. 311. 18*s.*

THERE are many books available to the dental student and practitioner on dental pharmacology both in this country and in America. We are therefore entitled to scrutinise a new book carefully to see whether it contains either new matter or a new presentation of the subject which would justify its appearance. We must confess that in neither respect does the book seem to be an improvement on various others on the subject. Pharmacology is a limited subject as far as the dentist is concerned, and any text-book designed for his use must be judged by the sections dealing with the therapeutics of the drugs which he uses in practice. Tested by this practice this book supplies meagre information. Thus in the section on counter-irritants capsicum is mentioned, but no word is said of its use in dentistry, though it is one of the few counter-irritants commonly employed. In the chapter on hæmostatics it is stated that iron is unpleasant as an oral styptic on account of its inky coagulum. No warning is given of the caustic action in producing a slough which makes ferric chloride a drug which should never on any account be used to check hæmorrhage from the mouth. Turpentine is a styptic favoured by dentists, but finds no place in this book. The final section of the book is devoted to directions for laboratory work which are given in some detail. Many of these are animal experiments on frogs, cats, and dogs,

though doubtless useful to the advanced student of pharmacology, are happily not part of the already overburdened curriculum of the dental student in this country. From the point of view of the British dental student this book has no advantages over those already available for his use.

Short Practice of Surgery

Second edition. By HAMILTON BAILEY, F.R.C.S., Surgeon, Royal Northern Hospital; and R. J. MCNEILL LOVE, M.S., F.R.C.S., Surgeon, Royal Northern and Metropolitan Hospitals. London: H. K. Lewis and Co., Ltd. 1935. Pp. 988. 30*s*.

THIS is a much improved and enlarged edition of a text-book which in two years has established its popularity. It now provides in one volume, instead of two, a survey of general surgery. A good deal of revision has been done and many more illustrations have been added. In a book of this size there is obviously not space for the criticism and assessment of various surgical procedures, but the main facts are there, simply and vividly stated, and their exposition is assisted very materially by the excellent printing, the arrangement and choice of type, and the numerous illustrations. This new edition will appeal, even more strongly than did its predecessor, to the student reading for final examinations.

Aids to the Analysis of Foods and Drugs

By C. G. MOOR and WILLIAM PARTRIDGE. Fifth edition revised and partly rewritten by JOHN RALPH NICHOLLS. London: Baillière, Tindall and Cox. 1934. Pp. 322. 5*s*.

IT is no small task to compress into 322 small pages sufficient information to enable a capable analyst to examine foods of practically all kinds eaten by man, and to estimate whether the foods he has analysed are of the nature, quality, and substance demanded, as the law of Britain requires them to be. Mr. Nicholls, a member of the Government Chemist's staff has done well in bringing the manual up to date without enlarging it unduly. The section on milk and its derivatives is good, some discussion of the milk of various animals being included. In a future edition the composition of the ash of milk as given by König might be replaced or re-edited. This adds up to 99·9 per cent. (p. 9), with all the bases given as oxides, phosphoric and sulphuric acids as anhydrides, and chlorine alone given as the element or ion. Dittmar ("Challenger" reports) in giving the composition of the solids of sea-water adopted the device of introducing a negative term—"less oxygen equal to chlorine of chlorides." Without some such device a mixed ionic and dualistic method of returning such analyses cannot be accurate. This analysis must be wrong somewhere. On p. 29 it might have been worth while to explain what an Adam's paper actually is. All one can gather is that it is one that can be rolled up. On p. 112 "corn cockle . . . is detected by its appearance as large black seeds" in flour; this suggests a means of detection in this fine powder much less likely to be successful than the recognition of the characteristic microscopic structure and colour of the outer coating of the seed.

Those who examine foods or drugs infrequently will, if possessed of chemical acumen, find this little volume very useful.

Dictionary of Applied Chemistry

Supplement, Vol. I. A. to M. By JOCELYN FIELD THORPE, D.Sc., F.R.S., F.I.C., and M. A. WHITELEY, D.Sc., F.I.C. London: Longmans, Green and Co., Ltd. 1934. Pp. 680. 60*s*.

IF we look back with regret on the eighteenth century as the time when it was possible for one man to have a grasp of at least one science, future generations will look back with envy on the present age as a time when it was still possible to write annual reviews, however arbitrary, and dictionaries of science, however incomplete. Of the functions and value of the volume under review there can be no doubt. Whilst it is supplementary to the volumes of a dictionary which appeared about ten years ago, the rigid dictionary form has been abandoned, and under many of the headings are to be found short reviews of our present knowledge. On the other hand a large number of the articles merely draw attention to work done since the appearance of the dictionary, and clearly serve another purpose. The articles are all by recognised authorities, and references are copious. One is impressed by the preponderance of "pure" chemistry in the work and the modest amount of technical and industrial detail; also by the growing importance assumed by biological chemistry. Among articles of special interest may be mentioned those on amino-acids, anthocyans, antimonials and arsenicals, carbohydrates, carotenoids, enzymes, and fermentation. Also there is a section on chemical warfare, a grim commentary on the present state of our civilization. In one article glutathione is represented as a dipeptide, though for five years the tripeptide formula has been accepted. It is churlish, however, to point out one cracked brick in a cathedral wall, and most of the articles are well up to date.

REPORTS AND ANALYSES

DIABETIC CHOCOLATE

(DE BRY (DE PARIS LTD.), 64, NEW OXFORD-STREET, LONDON, W.C.1)

THESE bars (weight of each about 9 grammes) are specially made for diabetic patients. In appearance the material resembles ordinary high-class chocolate, and is supplied in three flavours—vanilla, orange, and coffee. When consumed it has a pleasant full flavour of chocolate, and whilst not sweet like ordinary chocolate, it is not harsh or bitter. When analysed the following results were obtained:—

Moisture	2·03 per cent.
Mineral matter	2·40 ,,
Cacao butter	48·92 ,,
Protein	11·55 ,,
Soluble carbohydrates	12·70 ,,
Insoluble carbohydrates	22·40 ,,
Calorie value per lb.	2930

Natural cocoa nibs, with 3 per cent. of moisture, contain mineral matter 3·2 per cent., cacao butter 50 per cent., protein 14·4 per cent., and carbohydrates 30 per cent. It will be observed that the diabetic chocolate resembles nibs in composition.

Carbohydrates are a necessary constituent of all chocolates, but the amount in de Bry's is very low; it may be welcomed as a useful addition to the necessarily limited diet of a sufferer from diabetes.

THE LANCET

LONDON: SATURDAY, MARCH 23, 1935

INTERNATIONAL BIOLOGICAL STANDARDS

IN recent years frequent reference has been made in our columns to the adoption, by international agreement, of biological standards for certain therapeutic substances. The current number of the *Quarterly Bulletin* of the Health Organisation of the League of Nations announces the adoption of international standards and units for five further antisera, and in our issue of March 2nd (p. 504) reference was made to the adoption for international use of standards and units for four of the vitamins. The total number of international biological standards is now 22; they comprise standards for nine antisera, old tuberculin, insulin, pituitary (posterior lobe) extract, the œstrus-producing hormone, three substances of the arsphenamine group, four vitamins, ouabain, and digitalis. The provision of biological standards for international use is entirely a post-war development, and is due to the work of the Permanent Commission on Biological Standardisation of the Health Organisation of the League of Nations. The Commission came into being as a result of circumstances created by the war; the scope of its later work has steadily increased with the rapid progress of research resulting in the introduction into medical practice of specific remedies which, for their safe and effective application, require to be accurately standardised. Prior to 1914 few biological standards existed. The most important one was the standard for diphtheria antitoxin which had been established by EHRLICH and maintained at Frankfurt. This standard could be obtained without difficulty and was used in other countries for the verification of national or local standards. With the outbreak of war the standard maintained at Frankfurt became inaccessible, and after the war it was a matter of some importance to discover whether the unit for this antitoxin, which had been brought into temporary use, was identical with that originally established by EHRLICH. In 1921 the Health Organisation, on the proposal of its chairman, Dr. MADSEN, investigated this problem, and by international agreement the unit originally established by EHRLICH was accepted for international use. Investigations relating to the provision of international standards for tetanus antitoxin and old tuberculin were also undertaken. In 1923 a meeting of the International Physiological Congress in Edinburgh provided the opportunity for a conference on the provision of international standards for remedial agents other than immune sera and bacteriological products, such as the arsphenamines, pituitary extract, insulin, digitalis, ergot, and strophanthus. For the better coördination of the rapidly increasing work in this field the formation of a permanent commission was proposed at the Edinburgh conference, and this commission was appointed in 1926 by the Health Committee of the League of Nations, under the chairmanship of Dr. MADSEN. Belgium, Denmark, France, Germany, Great Britain, and the United States of America have been represented on it.

The activities of the commission are concerned mainly with standards for potent therapeutic agents, the activity of which cannot be adequately assayed or controlled by chemical means. Many of these products have been introduced into medical practice in comparatively recent times. They are specific remedies, some of them potentially dangerous, most of them administered by injection, and their dosage must be precise. The main object of the commission is to secure international agreement as to the standards and units adopted, in order that the activity of all preparations of this class, in whatever country they may be produced, may be expressed in a common notation and based upon the same standard and unit. With the adoption of the same standards and units in all countries, laboratory and clinical investigations can be placed on a reasonably quantitative basis, the results of such investigations carried out in different laboratories and hospitals throughout the world can be correlated and compared, and minimum requirements as to quality, purity, and potency can be defined. The adoption, by international agreement, of common standards of reference facilitates the work of all—the research worker, the manufacturer, the administrator, and the physician. It has been shown repeatedly—the cases of insulin and the vitamins are among the most recent examples—that the standardisation of substances possessing specific biological activity cannot be effected by simple observation of the effects produced in individual animals—i.e., in terms of animal reaction. On the other hand it has been shown repeatedly that by carrying out tests under strictly comparable conditions, the activity of a preparation of unknown potency can be expressed, often with a high degree of accuracy, in terms of another preparation of the same substance, the potency of which is known. The latter is the "standard preparation," and its potency may be expressed in "units," the unit being defined as the specific biological activity contained in a certain quantity of the standard preparation. In the case of 17 of the 22 standard preparations, international agreement has been reached as to the dimensions of common units of activity. The size of the international unit is arrived at in different ways; sometimes a unit which has become well established through usage is adopted, as in the case of diphtheria antitoxin; sometimes an arbitrarily chosen weight of the standard is adopted. The procedure of the commission in establishing standards and units for international use is illustrated in the case of the five new serum standards reported upon in the *Quarterly Bulletin*. The proposed standards and units are submitted for investigation and criticism to experts in different countries and the results of the joint inquiry are presented

to the commission. Thus, by international investigation, conference, and discussion, agreement has been reached.

In most cases the international biological standard is a dry preparation of an arbitrarily chosen but representative sample of the therapeutic substance for which it is to serve as standard; or, when a pure substance is available, a sample complying with accurately defined physical constants. The standard is preserved in sealed ampoules, freed from oxygen, protected from light, and stored continuously at temperatures below 0° C. Under these conditions the specific biological activity of these different substances remains unchanged, as far as can be judged, indefinitely. In order that the standards may be brought into effective use throughout the world, the Health Organisation has placed the responsibility for their care, storage, and distribution upon the State Serum Institute in Copenhagen and the National Institute for Medical Research at Hampstead. Copenhagen is responsible for the serum standards and the standard for old tuberculin; Hampstead for the standards for the hormones, the vitamins, digitalis, and ouabain. By arrangement with the Health Organisation quantities of the standards are supplied to national central institutes, nominated by the League, for subsequent distribution to laboratories, institutes, and research workers in their respective countries; in some cases, in which arrangements for their supply through a national central institute has not yet been completed, the standards are supplied direct from Copenhagen or Hampstead to individual laboratories and research workers who may require the standards for their work. It is clear that, in order to meet world demands for long periods, large quantities of each standard must be prepared and maintained for distribution. This provision has been made by the commission, but if the standard preparations were to be used extensively for routine testing the stocks would quickly become exhausted. It is not intended that the standards should be used in this way. National distributing institutions and individual laboratories making regular and frequent use of these standards are expected to prepare subsidiary national or local laboratory standards, to assay these exactly in terms of the international standard, and to verify them at intervals.

In this country the international biological standards have been brought into effective use by means of the Therapeutic Substances Act and the British Pharmacopœia. Biological standards are maintained at Hampstead, and are supplied to licensees under the Act named, and to laboratories, institutions, and research workers in this country, and the overseas dominions. Ten of the standards have been wholly prepared at Hampstead where the preparation of several others has also been completed; a part of each of these standards has been retained to supply national and imperial demands. In other cases a part of the international standard, prepared in some other country, has been obtained for British requirements; and in still other cases national standards have been prepared at Hampstead and assayed exactly in terms of the corresponding international standard. In all cases, therefore, the biological standards provided for use in Greater Britain are either the actual international standards or their exact equivalent.

SPECIFIC PROTECTION AGAINST POLIOMYELITIS

RECENT work has thrown doubt on the possibility of influencing the course of poliomyelitis by the administration of serum. It is not an easy matter on which to obtain conclusive evidence, and time will be required before the question is answered finally. Meanwhile the investigators are turning their attention to specific prophylaxis. The effect of immune serum in preventing attacks of the disease among an exposed group has been tested by one or two workers; the evidence is as yet insufficient to allow of any conclusion. But even though serum were of value when used in this way, the method would suffer from the defect inherent in serum prophylaxis; the immunity conferred would be only short-lived.

Most is to be hoped from a method of active immunisation which is both effective and yet safe enough to be used in man, and already there are indications that this may be achieved. Experimental work in the United States of America has shown that monkeys can be given live virus by the cutaneous or subcutaneous routes without ill-effect, and that immunity results; monkeys have also been immunised with serum-virus mixtures or with virus absorbed on aluminium hydroxide. These methods have been deemed unsafe for use in man. A few months back M. BRODIE, in New York, produced evidence[1] that poliomyelitis virus, inactivated by means of formalin, was capable of producing immunity in monkeys, and that such a vaccine could be used in man without harmful results. More recently, J. A. KOLMER, G. E. KLUGH, and ANNA M. RULE have published[2] details of another method of vaccination against poliomyelitis. Their vaccine consists of a 4 per cent. suspension of poliomyelitis monkey cord in 1 per cent. sodium ricinoleate which has been stored for one month at 10° C. After this period of time the maximum attenuation of the virus has, it seems, been achieved and the vaccine is ready for use. As a matter of fact, the attenuation which the virus undergoes as the result of this treatment is remarkably little, for monkeys inoculated intracerebrally with 0·2 c.cm. of a vaccine five months old developed poliomyelitis after an incubation period of twelve days; half that dose of a fresh suspension similarly administered produced the disease after an incubation period of eight days. However, the authors considered that this degree of attenuation, coupled with the fact that the strain of virus was of distant human origin, and that subcutaneous inoculation did not result in infection, justified their trying the vaccine in man. As a preliminary they showed first of all that the vaccine could be safely employed

[1] THE LANCET, 1934, ii., 610.
[2] Jour. Amer. Med. Assoc., Feb. 9th, 1935, p. 456.

in monkeys and that it produced a good degree of immunity. The authors' first human experiments were on themselves. Two of them received subcutaneous inoculations of 0·5, 1·5, and 2·0 c.cm. at five-day intervals; apart from local reactions no ill-effects ensued, and considerable amounts of neutralising antibody appeared in their sera. Following this, 25 children varying in age from eight months to fifteen years were given the vaccine; 22 received three doses at weekly intervals, 1 had two doses, and 2 had one dose only. Dosage varied according to age, those under 2 years receiving 0·25, 0·3, and 0·5 c.cm., whilst the older children had an initial dose of 0·5 c.cm., and a total of 2·0 to 3·5 c.cm.

The results were good. Apart from mild local reactions and some slight rise in temperature no ill-effects were noted, and judged by the neutralising power of the children's sera the immunity response was satisfactory. Fifteen of the children possessed no neutralising antibody before receiving the vaccine, and of these 11 showed considerable amounts when retested one week after the last dose of vaccine. The other 10 children whose sera neutralised the virus prior to vaccination all showed a marked increase of antibody, so that 21 out of the 25 responded to this treatment. The authors think that a better antibody response might be obtained by spacing the doses at 10 days instead of a week, but from observations on monkeys and some of the children they think that antibody production is rapid, so that the vaccine should be of use even during epidemics. It is, so far, not evident how this method differs as regards safety from methods previously tried on monkeys and deemed unsafe for man, and the merit of the work of Dr. KOLMER and his colleagues seems to reside more in their courage in trying their vaccine in man than in the method of its preparation. Extended trial will be necessary before this vaccine can be pronounced both safe and effective. But there is real need for such a vaccine in countries where poliomyelitis is prevalent.

ERGOMETRINE

IN 1932 CHASSAR MOIR showed by clinical experiment at University College Hospital[1] that aqueous extracts of ergot have speedy and remarkably powerful action in causing uterine contractions when given by the mouth to patients in the first few days of the puerperium. Similar results were not obtained by the administration of the purified alkaloids, ergotoxine and ergotamine, or of the amines, histamine and tyramine. It will be remembered that these findings caused considerable stir, since they were directly opposed to current pharmacological teaching, and practitioners in this country had even been reproached for continuing to prescribe the aqueous extract of the B.P. 1914, a preparation deemed inactive because it contained none of the essential alkaloids. The deduction from MOIR'S work that the traditional effect of ergot was due to a still undiscovered active principle of the drug seemed to be justified, but till quite recently this work had not been definitely confirmed by other observers, nor had the new active principle been isolated. Now, hard on a publication by A. K. KOFF, working in Johns Hopkins Hospital,[2] of a series of experiments showing results similar to those obtained at University College Hospital, comes the isolation of the active substance by H. W. DUDLEY, F.R.S., and MOIR. KOFF, adopting the intra-uterine bag method of recording uterine contractions, has repeated the investigation of ergot preparations, and has confirmed MOIR'S observations in every essential. His main conclusions are as follows: certain fluid extracts of ergot have a remarkable activity in quickly stimulating contractions of the puerperal uterus. The alkaloids, ergotoxine, ergotamine, and sensibamine, produce slow and variable results when given by the mouth, although when given by intramuscular injection they produce a good clinical action. The crude fluid extracts used, however, had a more rapid, stronger, and lasting effect when given orally than did the alkaloids when given by the intramuscular route. Histamine, when given by the mouth, was found to be inactive; when injected intramuscularly it had a rapid but slight oxytocic effect. KOFF considers that 2 mg. of ergotoxine or ergotamine must be given by injection to produce a reliable uterine response, and that headache, vomiting, and visual disturbances often followed. MOIR had found 0·5 mg. to be the optimum dose, uniformly active when given by injection. KOFF has gone further and, in collaboration with Prof. MARVIN R. THOMPSON, has divided ergot into alkaloidal and non-alkaloidal fractions. The activity for oral administration was found to reside in the alkaloidal fraction, but remained unaffected by the removal of the alkaloids previously regarded as essential. These observations led KOFF to believe that the characteristic activity of preparations of ergot intended for oral administration is due to an alkaloid, or to a principle associated with the alkaloidal fraction of the drug.

Clearly the stage was set for further important developments in the pharmacology of ergot, and in last week's issue of the *British Medical Journal* the actual performance of the dramatic piece of work which completes this comedy is recorded. The principle responsible for the quick action of crude ergot preparations given by mouth has been isolated by DUDLEY and MOIR, and has been named by them ergometrine. This discovery marks the culmination of three years' work by an alliance of chemist and clinician; at every stage of the search the activity of the ergot fractions had to be determined by clinical experiment, and more than 140 such tests were made before the active crystalline substance was identified. Ergometrine is an alkaloid differing in its properties from any of those previously isolated from ergot, and probably simpler in composition; its formula has not yet been determined, but duplicate analyses of the substance recrystallised from benzene and dried in a vacuum at 70° C. gave the following values: C. 71·5, H. 7·4, N. 11·7 per cent. Orally administered in a dose

[1] Moir, C.: Brit. Med. Jour., 1932, i., 1119.

[2] Koff, A. K.: Surg., Gyn., and Obst., February, 1935, p. 190.

of 0·5 to 1 mg. it provokes, after an interval of 6½ to 8 minutes, contractions which, recorded by the intra-uterine bag method, prove to be identical in mode of onset and general character with those produced by active liquid extracts of ergot. It may also be given by intramuscular injection, when a dose of 0·25 to 0·5 mg. produces strong uterine action in 3½ to 4½ minutes. In two patients who received intravenous injections strong response followed doses of 0·05 and 0·1 mg. in 110 seconds and 65 seconds respectively. It is of interest that the tracing shown of the effect of one of these intravenous injections was made by a new method of recording uterine contractions which makes use of an apparatus to record the changes in uterine shape felt through the abdominal wall. This method, which has the obvious merits of simplicity and of the avoidance of the need to insert a foreign body into a uterus, has proved useful in exploratory experiments, but is not so accurate or so dependable as the intra-uterine bag. It is satisfactory to learn (private communication) that no signs of pyrexia have been attributable to its insertion among the puerperal patients coöperating in these tests.

The importance of the isolation of ergometrine requires no emphasis. Its pharmacology is being studied by Sir HENRY DALE, F.R.S., and Dr. G. I. BROWN, and doubtless their report will lead to re-examination of the problem of preparing extracts of ergot for clinical use. It will be remembered that at the present time ergot preparations are assayed and standardised in terms of their total alkaloidal content reckoned as ergotoxine. Now the main activity of oral preparations has been shown to depend upon the presence of an ingredient for which this test is not specific. Up to the present the only criterion of the presence of ergometrine is its characteristic action, after oral administration, on the human puerperal uterus; its action on isolated strips of the resting uterus of animals is masked by that of the other alkaloids, and the difficulties of recording contractions of the uterus of a puerperal animal after oral administration of the drug may well prove insuperable. Clearly large scale applications of this new knowledge must await the success of attempts to devise a method of determining the properties of ergometrine in official and other preparations, and so put the assay of ergot extracts on a satisfactory basis in relation to their clinical efficiency.

ANNOTATIONS

ŒSTRIN AND PARTURITION

THE function of œstrin during pregnancy has long been a matter of discussion. Œstrin exists in the body during this time in large quantities, yet the state of the reproductive organs is such that it cannot exert its normal action. Furthermore, experiments on animals have shown that the administration of additional œstrin can interfere with pregnancy and may produce abortion. These experiments, in conjunction with the fact that the rate of œstrin excretion reaches a high value by full term, have naturally given rise to theories which invoke this substance as one of the factors concerned in normal parturition. The obvious flaw in such theories is the difficulty of explaining away the œstrin which is produced previously. Why should it act so powerfully just at term, and yet have no influence in the preceding months when it is present in quantities only slightly smaller? The paper by Mr. Cohen, Dr. Marrian, and Dr. Watson, which appears on another page, throws new light on this problem. They point out previous sources of error in the quantitative estimation of œstrin excreted by the pregnant woman, and show conclusively that this œstrin is in a physiologically inactive form. Not until the last week or ten days of pregnancy is active œstrin excreted in any quantity, and normal labour is accompanied by an enormous increase in the active, and a decrease in the inactive, compound. As the Toronto workers point out, any theories founded on these facts must for the moment be speculative, but it is tempting to suppose that active œstrin is in some way necessary for parturition, and that during pregnancy the œstrin-producing tissues are becoming more and more active with this end in view. Possibly the œstrin they produce is useless, or possibly it would be harmful to the organism; at any rate it is converted into an inactive form and excreted until the critical time approaches, and then the process of inactivation is stopped and the body is flooded with active material. Other theories could easily be made to fit the facts, but whatever the explanation may be the new work makes it fairly clear that œstrin has a function during parturition which it is prevented from exercising in the preceding months of pregnancy.

BRITISH SOCIAL HYGIENE COUNCIL

WE publish this week a brief but forcible appeal from Lord Horder and a group of authoritative signatories for pecuniary support in furtherance of the objects of the British Social Hygiene Council. The letter is so explanatory of the reasons why the Council should receive hearty endorsement from the medical profession that further words in its support would be redundant, while the theme requires no embellishment. The Council was instituted in its first shape to deal with terrible evils—evils which leapt to the eye, but produced too little practical impression; and, what was worse, then menace was growing incalculably. By the vigorous coöperation of laymen and doctors the immediate situation was met and greatly remedied. But as the work went on its logical scope became revealed to those in the conduct of the Council's affairs; its efforts became widespread and from time to time we have referred to the imperial significance of many of its achievements. But the work that has been done has not received the recognition that it has merited, although regular publication of both the objects and performances of the Council has taken place, and its literature has been frequent and convincing. This is a bad time, as Lord Horder and his co-signatories admit, for launching an appeal to public benevolence—but with the far-reaching claims of charity every time is, and will be, a bad one. We wish to claim for the British Social Hygiene Council the sympathy and encouragement of the medical profession for the reasons set out in the appeal. And if any one of these reasons is more forcible than the others it is

that the Council recognises the supreme claim of our young people, who have the right to find the world in which they have to make their way, a wholesome one, and the right to expect protection from gross but remediable dangers.

THE ELECTROCARDIOGRAM IN DIPHTHERIA

In a study of electrocardiographic changes in 13 fatal and 194 non-fatal cases of diphtheria, Andersen [1] confirms the findings of previous observers. Patients dying in the first 15 days of the disease may show evidence of myocarditis in the first five days; but such changes are rarely conspicuous. Since the work of Warthin [2] and Schwentker and Noel [3] this "early" myocarditis has been attributed to degenerative changes dependent upon the general toxæmia. It is to this, rather than to damage of such specific structures of the heart, that death is due in this stage. After the fifth day the electrocardiographic changes are more striking, and death seems to depend directly upon the cardiovascular damage; this "late" myocarditis is ascribed to reactive and regenerative changes, and all parts of the curve may show changes. The signs of myocarditis are often overshadowed in the electrocardiogram by evidence of conductive lesions, notably intraventricular block, bundle-branch block, and complete heart-block. The more severe the case, the more obvious the changes. Complete recovery from all types of lesions is recorded, but damage may still be detectable when the patient leaves hospital and even as long as eight years afterwards. Although there is much agreement between electrocardiographic and clinical signs, the former usually precede the latter, and changes in the curves may demonstrate lesions which cannot be discovered by other means. The most important lesion which may be missed clinically is complete heart-block associated with a raised ventricular rate.

A STUDY OF MIGRAINE

The multiplicity of remedies advocated for the treatment of migraine may only serve to indicate our lack of knowledge of the nature of this common and incapacitating complaint. Certain it is that as yet we have no one specific line of treatment uniformly successful in all cases. It may also suggest that migraine has not one cause but many causes, and there have been many ingenious attempts to divide cases of migraine into various clinical types, though few deny a common constitutional or hereditary tendency. A recent study by Prof. P. Vallery-Radot and Dr. J. Hamburger [4] reviews much of the original work on migraine in the light of their own experience. They divide their patients, according to the apparent cause, into five categories: (1) endocrine, especially menstrual migraine; (2) digestive migraine; (3) biliary migraine; (4) anaphylactic or allergic migraine; (5) migraine of local origin with cervical neuralgia, and painful fibrositic nodules—treatment being suitably adjusted according to the type of case. In the menstrual type extract of corpus luteum, 12 injections immediately preceding the period, has given satisfaction if continued for several months. Digestive migraine, which appears to follow particular articles of food, is sometimes amenable to dietetic measures; Marcel Labbé has had success with a vegetarian diet, but Vallery-Radot has seen more from restricting special foods and reduction in starch and fats. In biliary migraine the authors choose repeated biliary drainage, although other workers have had results with salines and bile salts by mouth. In allergic migraine some patients respond to non-specific desensitisation, or to peptone in half-gramme doses before meals given over long periods. Finally, cases associated with tender fibrositic nodules in the soft tissues around the neck and skull may be relieved by massage, ionisation, or other physical measures. In the main these are the principles accepted by most clinicians elsewhere, but they will derive instruction from the authors' discussion of the diagnostic difficulties in separating clinical types, and of the many possible variations in dietetic or drug treatment. The book has an abundant bibliography.

[1] Andersen, M. S.: Acta Med. Scand., 1934, lxxxiv., 253.
[2] Warthin, A. S.: Jour. Infect. Dis., 1924, xxxv., 32.
[3] Schwentker, F. F., and Noel, W. W.: Bull. Johns Hopkins Hosp., 1929, xlv., 276.
[4] Les Migraines. Paris: Masson et Cie. Pp. 232. Fr.45.

THE BLINDING WORM OF GUATEMALA

The complete story of the pathological lesions of the eye, induced by the embryos of *Onchocerca cæcutiens*, the so-called "blinding worm" of Guatemala, is set out in a volume [1] which forms a notable addition to the splendid series of monographs issued from the department of tropical medicine of Harvard University, under the leadership of Prof. R. P. Strong. Records are supplied of the investigations made in Guatemala during part of the years 1931 and 1932, together with a subsequent study in the laboratories of the department of tropical medicine at Harvard, of the pathological material, parasites and insects collected in Guatemala, as well as in other centres where onchocerciasis prevails. Prof. Strong discusses the more important features of the work of the expedition in Guatemala and the success of the public health measures for the eradication of the disease, and Prof. Sandground writes a critical analysis of the genus onchocerca. An entomological study of the simuliidæ by Dr. Bequaert, and an epidemiological study of onchocerciasis in Guatemala by Dr. Ochoa complete the work.

Onchocerciasis in Guatemala is confined to three districts in which a high grade of coffee is grown; there the climate is temperate and the altitude approximately 2500–5000 ft. In all the endemic areas the three species of simulium which transmit the disease—*S. metallicum*, *S. callidum* and *S. ochraceum*—are found in abundance. Over 98 per cent. of all cases of onchocerciasis occur in the prevailing Indian population. In Guatemala the tumours produced by the adult worms—*Onchocerca cæcutiens*—occur mostly in the scalp or in the region of the head, whereas in West Africa the patients with this disease tend to have the lesions on the body. The microfilariæ, or embryos, are more numerous in the skin in the vicinity of the tumour than in the skin at more remote places. The tumours themselves are small, measuring 6–20 mm. in diameter, and a few only 1–2 mm. The most important pathological studies here set out concern the eye, and have been collected from investigations of 11 eyes removed at operation. In every case the microfilariæ were demonstrated in sections both in stained and in unstained preparations; unfortunately they tend to congregate in the tissues of the eye, possibly because they are phototropic. In the cornea

[1] Onchocerciasis, with special reference to the Central American form of the disease. In four parts: I., by Richard P. Strong, Ph.B., M.D., S.D., professor of tropical medicine, Harvard University Medical School; II., by Jack H. Sandground, D.Sc., assistant professor of tropical helminthology at the school; III., by Joseph C. Bequaert, Ph.D., assistant professor of entomology at the school; IV., by Miguel M. Ochoa, M.D., parasitologist, Salubridad Publica, Guatemala. Contributions from the Department of Tropical Medicine and the Institute for Tropical Biology and Medicine, No. VI. Cambridge, U.S.A.: Harvard University Press. London: Humphrey Milford, Oxford University Press. 1934. Pp. 234. 21s.

they are found under the corneal epithelium between this and Bowman's membrane; in the uvea, iris, ciliary body and choroid, the larvæ are found in the spaces of the stroma, and in the iris near the ciliary border. It has been reported by Torroella, in Mexico, that with the aid of the corneal microscope living microfilariæ can be seen in the anterior chamber. The evidence here marshalled provides a complete vindication of those who have associated the presence of this filaria in the body with serious disturbance of vision, and have suggested that the removal of cysts containing the adult parasite as a therapeutic measure. It is clear from these studies that this filaria is a pathological factor of the first importance.

A NEW PLASTIC MATERIAL

AN unbreakable material possessing the transparency and resistant qualities of glass should find many uses. A new synthetic resin, introduced by the Imperial Chemical Industries and shown on the stand of Mouldrite Ltd. at the British Industries Fair, has properties of this nature. It can be worked on the lathe, and some fine examples of turning in this material were seen at the Royal Academy Exhibition of Applied Art. Leukon, as the new material is called, can be shaped either by compression or by injection moulding. Its use in medicine and surgery is facilitated by its insolubility in water and alcohol, although liable to attack by emulsified disinfectants, a fact which would necessitate careful selection of sterilising agents. For measures and other containers, barrels of hypodermic syringes and similar articles, the present glass, ebonite, or metal might be replaced by Leukon; as it is a good insulator it should also prove useful for electrical apparatus. Artificial eyes offer another possible application. Both the possibilities and limitations remain to be explored, but there is already a good case for a strong transparent material which is easily moulded or worked with cutting tools, and is reasonably resistant to chemical attack. The published information does not show whether Leukon is easily inflammable.

A MOTHER'S RIGHT TO HER CHILD

THE birth of quintuplets in the province of Ontario has raised an unusual problem. The legislature of Ontario wants to make them "wards of the King," a form of nationalisation with which the parents disagree. It is not quite clear whether the new law is intended to prevent the parents from exploiting the exhibition of their progeny, or whether the State desires to acquire the babies as objects of rarity and virtue like the Codex Sinaiticus. The mother protests that already, when she goes to see them at the hospital, she is treated as a stranger. If there is no complaint against her character or her home, has not a mother an inalienable right to her children? Oddly enough, this very question has lately been before the London law courts "in the matter of Jean Crichton, an infant." Jean's mother, owing to the exigencies of her work, placed Jean with a Mrs. Hinckes and made adequate provision for her child's maintenance. The time came when Mrs. Crichton was in a position to make a home for Jean, and she asked for her return. The little girl, however, did not want to leave Mrs. Hinckes, and Mrs. Hinckes did not want to part with her. Mr. Justice Atkinson made an order giving Mrs. Hinckes the custody of the child, subject to an arrangement for Jean to visit her mother at holiday times. On an appeal against the order, two judges of the King's Bench Division allowed the mother's claim. They did not see how they could take away a child from a mother against whom there was no complaint. The wishes of a young child were not the only point to consider. There could be nothing against the mother, said Mr. Justice Singleton, since the order recognised that she was fit to have the custody of her child at holiday times. It was natural enough, said Mr. Justice Talbot, that Jean might be unwilling to leave Mrs. Hinckes, and that Mrs. Hinckes might be unwilling to lose Jean, "but I think the Man in the Street would be surprised to hear that there was any doubt about the matter." It has caused some astonishment in Lincoln's Inn and the Temple that the views of the Man in the Street should have been allowed to intrude into the administration of the law, but there is not much doubt which way a jury of mothers would decide. The case is to be taken to a higher court and the hearing of the appeal is being expedited.

LEUKÆMIA LATE IN LIFE

OUR knowledge of causative and therapeutic factors in leukæmia is so small that any additional information, however scanty, would be welcome. But Prof. Hans Curschmann[1] in reviewing 81 cases seen at his clinic in Rostock is able to throw no fresh light upon the ætiology of this fatal disease. Like other workers, he finds no particular incidence in any one occupation, no special association with infections such as influenza, tuberculosis, or malaria, nor any factors in heredity or constitution which seem to predispose. On the whole, he believes that it is a disease of the well-nourished rather than the poor or ill-nourished, and that it is on the increase rather than otherwise. From the standpoint of diagnosis, however, Curschmann's cases bring out a fact which may not be generally known—namely, that leukæmia is as common in old people as it is in youth or middle age. Thus, of his 51 patients with chronic leukæmia only 17 were under the age of fifty, whereas 34 were between the ages of fifty and seventy. In acute leukæmia the majority were between twenty and fifty, and less than a quarter of them above the latter age. In older people the aleukæmic form appeared especially often, particularly in the myeloid type; thus, of 12 cases of myeloid leukæmia in old people, 8 were described as aleukæmic or subleukæmic. In the whole series the incidence of lymphatic and myeloid types was about equal. Curschmann's figures emphasise the importance of remembering leukæmia as a not very rare disease of old people, and of examining the blood in doubtful cases of cachexia, cardiac weakness, severe sore throat, doubtful sepsis, or unexplained hæmorrhage from nose or gums, or into the skin—whatever the age of the patient.

PHYSIOLOGICAL HISTOLOGY OF THE BREAST

THE first of a series of studies of the histology of the breast in relation to tumour growth has been published by Dr. Edith Dawson.[2] In this, which is evidently planned to clear the ground for the main part of the work, the early development and physiological histology of the breast are considered at some length. Despite reports to the contrary there seems to be no sound evidence of the occurrence of mammary secretion in the new-born. Such "secretion" as observers have described from time to time seems to be derived from the break-down of ductular cells which for some unknown reason have undergone excessive proliferation. True secretory tissue does not appear before maturity, and the term secretion should, in Dr. Dawson's opinion, be reserved for "the formation of differentiated tissue and the activity of specific secreting cells,

[1] Deut. med. Woch., Feb. 22nd, 1935, p. 285.
[2] Edin. Med. Jour., 1934, n.s. iv., 654.

the secretion being produced and discharged without necessary destruction of these cells." The question of epithelial activity in the menstrual cycle is still unsettled. On the one hand Rosenberg and others have maintained that an active evolution of lobular tissue occurs in the premenstruum followed by complete involution when the period is over. Dieckmann, on the other hand, considers that the lobules are formed by slow growth over many years and, when formed, are persistent. According to him the menstrual changes are associated not with epithelial activity but with a retention of fluid in the lobular connective tissue; there is thus, in the premenstruum, a physiological œdema round the lobule. This œdema disappears after the period. Dr. Dawson's observations support Dieckmann's theory. It is of course possible that such a change is part of a more general disturbance in the water balance. In this connexion it may be recalled that J. S. Sweeney has recently described, in a preliminary report,[3] an increase in body-weight in a series of normal women just before, or at, menstruation. This increase amounted to three pounds or more in about 30 per cent. of his series. In rare instances there may even be a demonstrable pitting of the subcutaneous tissues at this point in the menstrual cycle.

THE ITCH

ITCHING, as a subject of discussion, might suggest to some an Elizabethan breadth of treatment, but for Dr. W. Thomson Brown, who addressed the Hunterian Society on March 18th, it was the key to an austere world of end-organ rhythms and colloid changes. From his erudite paper which, he was willing to admit, had only scratched the surface of the subject, some practical measures emerged—as that massive doses of calcium chloride should theoretically relieve itching, and that something was to be expected of the removal of septic foci, and of reflex causes of irritation such as threadworms. He pointed out that Napoleon III was at ease in a hot bath. The ensuing discussion showed an almost Freudian preoccupation with the orifices. Mr. Ernest Miles, speaking of pruritus ani, divided cases into those with a pathological condition in the anus or rectum (80 per cent.), those with some diathesis—gouty, rheumatic, or eczematous—predisposing them to itch (10 per cent.), and those with a neurosis (10 per cent.). Those in the second group called for dietetic treatment, and those in the third were incurable, and would probably greet him in the hereafter with the words, "Doctor, I still itch." Those in the first group could be cured if the cause was found and treated; if no external cause was evident, internal piles or internal fistula must be sought, and the sigmoidoscope employed to search for carcinoma recti. In many cases recovery followed division of the pecten band; this extended from Hilton's white line below to the edge of the valve of Morgagni above, and was apt to become fibrosed in its submucous layer, preventing proper expansion of the external sphincter. Mr. A. Dickson Wright said he never felt sure that he had identified the pecten band in an anæsthetised patient. He has had the experience, possibly unique, of being blackmailed by a patient who threatened, unless she was given immediate treatment, to commit suicide and leave a note saying that the hospital had refused to take her in. He hastily admitted her, and divided all the cutaneous nerves to the perineum, with such excellent results that he had since done the same thing to 15 other patients. Dr. F. Howard Humphris likes to treat pruritus ani with X rays, and Mr. Cecil Rowntree paints his patients with carbol fuchsin two or three times a week. Mr. A. E. Porritt saves time by injecting a solution of alcohol subcutaneously round the rectum once every two or three months.

In considering the treatment of pruritus vulvæ, Dr. E. Bellingham Smith drew attention to the resemblance between pathological changes in the vulva and the tongue. A source of irritation or infection, he finds, is commonly present in the vagina, and is derived, as a rule, from an inflamed cervix. The vigorous handling and thorough scouring which the cervix receives during examination under an anæsthetic usually has the effect of clearing up the infection and the pruritus with it. Cervical infection can otherwise be treated with a colloidal silver or some other form of pessary, the discharge being kept from the surface of the vulva by some soothing, mildly astringent application such as hazeline. Mr. Rowntree claimed to have found the most effective treatment for general pruritus in massive scratching. Being afflicted, following an injection of serum, he had boldly made use of two new hair brushes with gratifying results. Dr. F. J. Oxley, who presided, wanted to know why scratching was so delightful, to which Dr. Thomson Brown gave the oracular answer that in pain there was a slowing of the end organ rhythm, whereas in pleasure it was quickened—that was why.

Many speakers referred to the danger of suicide in patients who were not effectively treated, a danger vividly illustrated by Dr. Oxley, who said that a man pursued by a mad bull would forget an injured leg, but not pruritus ani. The association of generalised pruritus with jaundice diabetes and pernicious anæmia, and of itching of the shins in Hodgkin's disease, were mentioned by Dr. G. Mitchell Heggs, and the value of really dilute sulphur applications in scabies was recalled by Dr. D. C. Norris.

THE seventh International Congress on Industrial Accidents and Diseases will be held in Brussels from July 22nd to 27th. The chairman of the British committee is Sir Thomas Oliver, and particulars may be had from the secretary of the Industrial Welfare Society, 14, Hobart-place, London, S.W.1.

ON Tuesday, March 26th, and on the following Thursday, Prof. C. R. Harington, F.R.S., will deliver the Oliver-Sharpey lectures to the Royal College of Physicians. He will speak on the biochemical basis of thyroid function. The lectures will be given at the College at 5 P.M. Members of the medical profession will be admitted on presentation of their card.

TUBERCULOSIS SCHOLARSHIPS AT ROME.—The Italian Fascist National Federation against Tuberculosis has placed at the disposal of the International Union against Tuberculosis six scholarships at the Carlo Forlanini Institute in Rome.

The scholarships are of a value of 3000 liras, plus board and lodging, and are intended to enable foreign medical practitioners to reside at the Institute and to follow a course of study there. They will be awarded to young physicians already familiar with tuberculosis problems who wish to improve their knowledge of this branch of medicine. The names of British candidates, accompanied by particulars as to their age, qualifications and professional experience, must be forwarded not later than June 15th to the secretary, National Association for the Prevention of Tuberculosis, Tavistock House North, Tavistock-square, London, W.C.1.

[3] Jour. Amer. Med. Assoc., 1934, ciii., 234; see THE LANCET, 934, ii., 493.

PROGNOSIS

A Series of Signed Articles contributed by invitation

XLV.—PROGNOSIS IN CHRONIC PULMONARY TUBERCULOSIS

I

To estimate the outlook in the case of a particular patient suffering from chronic pulmonary tuberculosis a survey of the constitutional symptoms, of the nature and extent of the lung lesions, and of the economic and mental circumstances must be made. A study of the temperature, body-weight, and pulse-rate are amongst the most helpful aids to prognosis; and the presence or absence of tubercle bacilli in the sputum is of great importance. Returns from the Forster Green Hospital, Belfast, published by Dr. B. R. Clarke (Ulster Medical Journal, October, 1932), referring to 700 patients in the hospital over ten years ago, show at the end of the sixth year after that of discharge from the hospital 72·5 per cent. of those without tubercle bacilli in their sputum (T.B. minus) were alive, but only 22 per cent. of the rest (T.B. plus). Similar results were obtained in 1919 by Dr. Noel Bardswell, who investigated the after-histories of 1700 patients treated at Midhurst. The percentage alive 5½ years after discharge from the sanatorium was as follows: 85 per cent. in T.B. minus cases; 79 per cent. of cases T.B. plus on admission but T.B. minus on discharge; and only 36 per cent. of those patients whose sputum was still positive on discharge.

Those who get the advantage of institutional treatment live longer than those who do not. Even before the institutional doctors added collapse therapy to their armamentarium their results were better. Thus Stadler showed 16 years ago that only 40 per cent. of 670 first and second stage patients not treated in a sanatorium were capable of full work at the end of four years, against 60 per cent. of 716 similar patients treated at the Prussian and Hessian Railway Sanatorium at the end of five years. Nowadays with the appropriate use of collapse treatment the advantages of institutional treatment are still greater. Artificial pneumothorax alone has improved the outlook of advanced or moderately advanced cases, and it is best at least to start this treatment in an institution. This is illustrated by the following results of treatment in a British sanatorium where artificial pneumothorax was not used until 1925. The total number of patients dealt with between the years 1919 and 1931 was 1160. The percentage of all T.B. plus cases alive 1½ years after discharge from the institution rose from an average of 40 per cent. for the years 1919 to 1925 inclusive to an average of 59 per cent. for the years 1926 to 1931 inclusive, though the proportion of advanced cases went up from 38 per cent. to 50 per cent.

The late Dr. Arthur Latham wrote 14 years ago in an article on the prognosis of pulmonary tuberculosis: "The extent or character of physical signs is of little assistance in determining the activity of the disease; the important things are the degree of toxæmia and the response of the individual." Although considerable advances have been made since he wrote that sentence, particularly in X ray technique, enabling the extent and character of the disease to be gauged more accurately, it is still true to say that the nature of the disease present can be assessed best by a study of the symptoms. Even radiologists who are specially good at taking and interpreting radiograms of the chest wisely hesitate to give an opinion, particularly a prognosis, without knowledge of the patient's state. One who was reluctantly inveigled five or six years ago into giving his opinion on the evidence of a film alone said that he thought the patient could not possibly be alive six months later. The patient was, however, well and in active work at that date, and has remained so ever since.

THE TEMPERATURE

It used to be considered that a raised temperature, if it had been accurately taken (preferably per rectum), was a sure sign of active disease, and its absence an indication of quiescence. In the days of K. Turban and J. Kingston Fowler it was shown that the prognosis could be gauged with some degree of accuracy by reference to the height, character, and persistence of the pyrexia, and that this was one of the best measures for estimating the degree of toxæmia. Twenty-five years ago I published an article [1] emphasising the importance of this factor. There is no need to deduct anything from the teachings of Turban and Fowler, and I see no reason to unsay anything I wrote then. But we have learnt much in the last 20 years, and one thing is that occasionally disease may progress in the lungs and yet no fever be present, even the minor degrees recorded only by very precise and careful observations. Nevertheless the following figures of recent date supplied by Clarke in the paper already quoted are worth attention. Of 448 T.B. plus cases 93 were admitted with febrile temperatures, 174 with subfebrile temperatures, and 181 with normal temperatures.[2] At the end of 6½ years after discharge: of the first group only 1·1 per cent. were alive; of the second 17·2 per cent.; and of the third 37·6 per cent. Many practitioners are still, unfortunately, ignorant about the refinements of body temperatures which are of importance in the guidance of patients with active tuberculosis along the paths that lead to recovery. If it were more widely recognised that a morning temperature at rest of 97·8° or an evening one of 99° (oral readings for eight minutes or more with a "minute" thermometer) often constitute fever, and if rest was prescribed under such circumstances, the prognosis for many patients would be greatly improved.

SYMPTOMS AND PHYSICAL SIGNS

The response of the individual gives indications of the prognosis. This can be measured by a study of the symptoms and by the physical signs (including X ray findings). At one time too much weight was given to the examination of the chest, and this tendency is still sometimes in evidence. It is due to the strides which have been made in discovering the nature and extent of the pulmonary lesions by means of X rays. It is true that these means of investigation are superseding the stethoscope and the ordinary old-fashioned methods of examining the chest, but that is no excuse for relying upon them

[1] THE LANCET, 1909, ii., 852.

[2] The records are all of mouth temperatures and the classification refers to the first week after admission to hospital, or in borderline cases the first fortnight. "Febrile temperature" is an evening temperature exceeding 99·6° F. on at least three occasions during the week. "Subfebrile temperature" is a temperature between 98·8° and 99·6° on more than one occasion during the week. "Normal temperature" explains itself; a single rise to 99° during the week was disregarded.

too exclusively. Another point in regard to the radiological findings is that they must be correlated as far as possible not only with the ordinary clinical findings and symptoms, but, almost equally important, with the history. The extent and character of the lesions can best be gauged by good radiology so long as these reservations are borne in mind, and provided experience has been acquired in interpretation of radiological findings, which must include a screening. Space allows only the mention of a few broad outlines on this question. The extent is less important than the nature of the lesions. Exudative disease, indicated by soft-edged shadows of rather a woolly kind, denotes a worse type of disease and a poorer resisting power than shadows with sharp edges and harder outlines. The rate at which lesions have spread or softened can sometimes be surmised, without serial radiograms, by correlating the film obtained with the history. The significance of cavities will be dealt with later.

A correct prognosis is based upon a thorough and correct diagnosis. Together they combine to lead up to correct treatment. The three naturally and essentially react one upon the other. Consider the patient after convalescence has been reached. Suppose a complete diagnosis has been made and the appropriate treatment has restored health. There is still much affecting the liability to relapse coming under the head of "after-care." This should attend not only to the medical but also to the social and economic circumstances. The medical circumstances include those relating to the physical environment. Under this head the most important point is always the avoidance of over-fatigue of any kind. Fatigue is more readily engendered when discontent troubles the spirit, and this may go with idleness or inappropriate occupation as well as with unhappiness from other causes. These points are not always remembered when the effect of occupation upon prognosis is up for consideration. The calling of which the patient has experience is generally the easiest and most lucrative and should not be lightly abandoned. The kind of work and the way leisure is used must always be looked upon as affecting the prognosis far more than climatic conditions. Though clean air in a "bracing" climate (which means one possessing a marked cooling power) materially helps to establish and maintain recovery, it is seldom that the prognosis is very materially influenced by the supposed magic of certain climates. Too much emphasis is usually placed upon these influences. On the other hand, a fondness for fresh air, by which is not necessarily meant *exercise in* the open air, contributes a good deal to a lasting recovery. During the first year or two ex-patients should feel acutely uncomfortable in a vitiated, stagnant atmosphere. The social circumstances affecting "after-care" embrace those conditions of environment which affect the mental state of the ex-patient. These and some further points will be dealt with briefly next week.

S. VERE PEARSON, M.D., M.R.C.P.,
Physician to the Mundesley Sanatorium.

(To be concluded)

SPECIAL ARTICLES

MALARIA IN CEYLON

As lecturer and Milner research fellow in entomology at the London School of Hygiene and Tropical Medicine, Dr. V. B. Wigglesworth has lately spent some time in Ceylon, and on March 14th, in a lecture delivered at the school, he gave some account of his observations on the present epidemic of malaria. Sir Rickard Christophers presided.

Ceylon, said Dr. Wigglesworth, lies between 5° and 10° north latitude and has an area of 25,000 sq. miles. There is a central system of mountains in the southern half, rising to 8000 ft. but most of the country consists of low-lying undulating plains. The recent epidemic has affected the south-western area, which is traversed by the great rivers. The south-western quadrant receives the S.W. monsoon and has an annual rainfall of 100–200 in., chiefly between May and September. Of the total population of about 5½ millions, some 3½ millions reside in this wet zone. There are about 20 species of anopheline mosquito. By all the rules of malariology, the foothill zone ought to suffer from the most intense malaria carried by the stream-breeding species of anopheles, notably *A. maculatus*. This, however, does not prove to be so—possibly because the cool nights restrict the development of the parasite in the mosquito, or because mosquitoes in that part feed on cattle rather than men. The most malarious part of the island is the dry zone, jungle country where the uncertain rains are stored in embanked lakes, and the rivers and streams dry up during the dry season, leaving a series of pools in which *Anopheles culicifacies* breed prolifically. There is an increased incidence of malaria every year about a month after the onset of rain. The spleen-rate over the foothill zones is under 20 per cent., and in the dry zone about 50 to 60 per cent. In 1932, an average year, 1¼ million cases of malaria were treated, and 12,000 lb. of quinine and over 2 million tablets had been distributed free, at a cost of £23,000.

In the wet south-western quadrant the streams run throughout the year, and there are extensive swamps. The dominant anophelines are the harmless swamp species, and the spleen-rate is only about 5 per cent. In recent years, however, it has been realised that malaria can be of considerable local importance in this zone. It has been shown to be river and drought malaria—i.e., occurring mainly along the banks of the chief rivers and only after exceptionally low rainfall when the rivers are broken up into pools. Healthy years in this zone are those in which the July, August, and September rainfall is above 20 in. This malaria is also carried chiefly by *A. culicifacies*, and the longer the drought period the more prolific is the breeding of this insect. The increase in its numbers has been shown to run parallel with a rise in the attendance-rate at hospital, and the death-rate.

CONDITIONS IN 1934

The year 1934 was one of exceptional and widespread drought, and circulars were sent out at the end of September warning health officers of the likelihood of an epidemic. A fortnight later a definite increase in dispensary attendance was noticed. The initial outbreaks occurred on the immediate banks of rivers, but during October there were occasional days of heavy rain, and innumerable temporary breeding-places were created. November and December were dry. Thus, more perfect conditions for the multiplication and spread of the mosquito could not have been devised, and at the beginning of

December the hospital attendances shot up in an alarming manner.

When Dr. Wigglesworth arrived in Ceylon at the end of December, the roads were crowded with patients trailing along to the dispensaries, or being carried in litters or bullock carts. The dispensaries were surrounded by dense crowds, many of the patients shaking and vomiting with malaria. The hospitals were exceedingly crowded and temporary wards were being erected. The staff looked ill and were obviously overworked. The dispensary attendances in some places had risen from an average of 300 a week to over 4000. The area affected is about 5000 sq. miles, one-fifth of Ceylon. It is bounded on the north by the dry zone, on the east by the hills, and on the south stretches almost to the coast. Both incidence and severity seem to be worse in areas where the spleen-rate is normally low. In many villages every inhabitant was affected. In the bad area there were two towns where antimalarial measures had been carried out for many years. In one of them there had been comparatively little increase in malaria during the epidemic, but in the other, where the control measures had only been carried out over a radius of half a mile from the centre of the town, the population was suffering badly. Rivers were everywhere very low, and residual pools were teeming with *culicifacies* larvæ. Often elephant hoof-marks formed little pools which made ideal breeding-places. *A. culicifacies* was by far the commonest species found in the houses. Adult mosquitoes showed an average infection-rate of 14 per cent. over the whole epidemic area, and in one part the rate was 21 per cent. No other species was found infected.

The dominant form was the benign tertian; malignant tertian formed only about 10 per cent., and quartan was rare. At the Colombo General Hospital 90 per cent. of the cases were malignant tertian, and the wards were filled with comatose cerebral cases, while other patients were crowded in the verandas, and the courtyard was full of biers and hearses—a really dreadful picture. The picture was not, however, repeated throughout the epidemic area, for although the morbidity was almost general, little was heard about deaths in the country districts. Even among 2223 hospital in-patients in Kegalla, the heart of the epidemic area, there had only been 64 deaths, a case-mortality of 2·87 per cent., as opposed to nearly 7 per cent. in the Colombo Hospital. The main causes of death had been cerebral malaria, convulsions in children, dysentery in the aged, and miscarriage among women. The total deaths have since been reported as 38,000, probably indicating a case-mortality of about 1·5 per cent. Two outstanding clinical features were the dysenteric symptoms, which always responded promptly to quinine, and the fact that "the children were beginning to swell"—œdema of the legs and face. The true nature of this condition had not been decided at the time of Dr. Wigglesworth's visit.

SYSTEM OF CONTROL

Antilarval measures were useless by the time the epidemic broke out, even if they had ever been practicable. The main problem was how to get quinine to the people. In the early days the former procedure of distribution by sanitary inspectors was employed, but it soon proved impracticable for the epidemic. The distribution by this means proved to be very unequal. The entire policy was therefore changed early in December when the magnitude of the epidemic became apparent. The sanitary inspectors were sent round the districts to collect information and to explain to the people where to send for the medicine, but only to issue quinine themselves in urgent cases. They rendered daily reports to the medical officer of health, as a result of which temporary treatment centres were established on the basis that nobody should be compelled to go more than two miles to obtain quinine. A temporary treatment centre close to a severely affected village would be open every morning, and the apothecary or dispenser in charge of it would cover two outlying centres in the afternoons, taking Sunday afternoon as a holiday. This organisation worked remarkably well when efficiently carried out, but was too quietly efficient to receive much appreciation from the public press. Something more was required, however, than the mere doling out of drugs, and in some places the people would neglect a neighbouring dispensary and flock to a distant one because they had faith in a particular doctor. The same drought which precipitated the epidemic caused a widespread failure of the rice crop, and the destitution and the epidemic formed a vicious circle.

Could that epidemic have been prevented? To prevent the breeding of *A. culicifacies* over some 300 miles of river and an indefinite extent of tributary streams and temporary breeding-places would have been a far vaster undertaking than has ever been attempted for the control of rural malaria, and its cost would have been prohibitive. The rivers were too broad for periodic sluicing by dams. The control of rural malaria in general is a problem demanding the coöperation of all Government departments. Until that is secured the medical department alone is powerless to do more than administer treatment. It is another matter to prevent malaria over the limited district of a town or estate, and given an intelligent and energetic direction there is no reason why such aggregations of people should not be able to protect themselves. In conclusion, Dr. Wigglesworth hoped that he had succeeded in dispelling the idea created by the lay press in Ceylon that there was anything fundamentally mysterious about the causation of the epidemic.

MEDICINE AND THE LAW

Fees for Midwifery Emergency Cases

FOUR doctors last week succeeded in the Court of Appeal in a claim against the Monmouthshire County Council for fees for their services when called in by midwives in cases of emergency. The basis of the claim was Section 14 of the Midwives Act, 1918, whereby "in case of any emergency . . . a midwife shall call to her assistance a registered medical practitioner, and the local supervising authority shall pay to such medical practitioner a sufficient fee . . . according to a scale to be fixed by the Local Government Board" (now the Ministry of Health). It was not denied that the doctors, in the services to which the claim related, had been called in properly in genuine cases of emergency; the county court judge had found that they had done everything which prima facie gave them a right to be paid their fee under Section 14. The Ministry of Health, however, when purporting to prescribe the scale of fees for these services, introduced conditions which meant that certain doctors would get no fee at all. A Government department has no right to legislate unless the power is given by some enabling Act. There was a question whether the conditions thus introduced were intra vires—within the powers of the statute. The Court of Appeal says they were ultra vires and therefore

invalid. The County Council has asked for leave to take the case to the House of Lords. Leave has been given on condition that the County Council pays the costs of all the four doctors in any event—partly because the amounts claimed are small, and partly because the judges thought there were "administrative methods" of dealing with the matter otherwise than by litigating over a point of judicial interpretation. The County Council is to consult the Ministry of Health since it is the latter's action which is challenged.

The questioned condition introduced by the Minister's regulations declared that the local supervising authority was not to pay a fee "where the doctor has agreed to attend the patient under arrangement made by or on behalf of the patient or by any club, medical institute or other association of which the patient or her husband is a member, or where the doctor is under obligation to give the treatment to the patient under the National Health Insurance Acts, 1911 to 1922." Three of the four doctors were medical officers to the Ebbw Vale Workmen's Medical Society, the members of which pay a contribution of 2*d.* in the £ of their weekly wages in return for medical treatment for their dependents. The agreement between the society and the members does not mention midwifery, but the rules state that doctors attending midwifery cases, or complications arising therefrom within 28 days thereafter, shall be entitled to a fee from the patient of not more than 10*s.* 6*d.* The secretary of the society stated in evidence that this part of the rules had been recognised as inapplicable ever since the 1918 Act was passed. The fourth doctor was not a medical officer of any medical society, but was remunerated by a scheme of poundage. Until 1932 the County Council paid fees for the services of doctors called in by midwives in cases of emergency; but in 1932 it decided to pay only where the patients' husbands had been unemployed for over 18 months. It relied on the Minister's regulations, and refused to pay the four doctors because they were said to have agreed to attend the patients under arrangements made "by or on behalf of the patient or by any club, medical institute, or other association." The doctors' case was fought jointly by the two medical defence societies, of which they were severally members.

The Master of the Rolls and Lords Justices Slesser and Romer were unanimous in declaring this part of the regulations to be invalid. Lord Justice Romer said the Act gave power only to prescribe a scale of fees which would apply generally to every practitioner whom the midwife summoned in emergency. The Ministry, he said, had no power to discriminate between one medical man and another. It could not say, for instance, that a practitioner who bore the degree of Doctor of Medicine should be paid at a higher rate than one with a lower degree. Still less could it say that a Doctor of Medicine should receive less than a practitioner with a lower degree on the ground that in the case of a Doctor of Medicine, his general run of patients, being of a higher class, can afford to pay him higher fees so that he could afford to attend to cases under Section 14 of the Midwives Act for a smaller fee. It had been argued that the Ministry introduced its conditions so as to stop payment where the doctor was adequately remunerated from other sources. Lord Justice Romer said it was well known that doctors did a great deal of work for no fee at all, or for a wholly inadequate fee; without commenting on the fees paid by clubs and medical institutes, he hinted that doctors often attended patients of this kind for a wholly inadequate fee. He thought it wrong to say that the Minister's regulation had introduced a condition which applied only to doctors who had been adequately remunerated. It had also been argued that the Minister's object was to prevent doctors being paid twice over for the same services. The Lord Justice pointed out that under Section 14 the doctor looked to the local authority, not to the patient or the club or society. The doctor would not be paid by the club or society for the emergency work. He was paid by the club or society at a flat rate for all the occasions when the patient could reasonably call for his services; he was paid by the local authority for the particular occasion when he attended the urgent summons of the midwife. Another part of the Minister's regulations said that the doctor should have no fee under Section 14 if he performed any services after the expiry of four weeks from the date of birth; further, he was to have no fee for services performed by him more than ten days after the date of his first attendance unless he gave the local supervising authority his reasons for considering his further attendance necessary. Lord Justice Romer said he could see no right whatever for the Ministry to impose a condition excluding the fee when the practitioner was called in on a second emergency. If the case is now reviewed by the House of Lords, where recent decisions of the Court of Appeal have not emerged unscathed, the results should be interesting. If their lordships think a department has been encroaching upon the functions of the Legislature, they will not hesitate to say so.

Insanity after Sentence

It was announced last week that, as the result of a medical inquiry under Section 2 of the Criminal Lunatics Act, 1884, James Robert Vent had been certified insane. He was sentenced to death last month at the Central Criminal Court, but now his death sentence is respited and he goes to Broadmoor. Thus another is added to the list of cases where a man has been deemed sane enough to be found guilty, yet not sane enough to be hanged.

Vent's case was curious. On Feb. 14th he pleaded guilty to the murder of Clementina Balchin. When he entered the court at the trial he smiled in all directions, and seemed to find entertainment in the proceedings. Mr. Justice Talbot asked an experienced counsel to see Vent and to explain the nature of his position. Counsel interviewed him in the cells but failed to get any coherent statement out of him; an unsuccessful attempt was made for ten minutes to explain how serious the matter was. Counsel then returned to court and reported to the judge the negative result of his interview. The prison medical officer gave evidence that Vent was sane and fit to plead, and the trial began. Vent continued to plead guilty and refused legal assistance, and the court passed the inevitable sentence. Almost every case of a death sentence finds its way to the Court of Criminal Appeal. Vent applied for leave to appeal and counsel appeared in support of the application. The appellate tribunal found itself unable to investigate the man's mental condition; that was now a matter for the "proper authorities," a phrase which presumably means the Home Secretary, who can direct a medical inquiry under the Criminal Lunatics Act and can advise the Crown upon the exercise of mercy. All that counsel could say on Vent's behalf was to suggest that he had not really been fit to plead at the trial. The Court of Criminal Appeal soon knocked this ninepin over. The question of fitness to plead cannot be raised unless there is reason at the trial to doubt whether the accused appreciates the nature of his confession and the consequences which follow it. The judge at trial had been aware of Vent's statement

to the police wherein he described the crime and said his motive was jealousy. Vent had drawn up unaided the application for leave to appeal: in it he said he had been drinking, he was out of work and miserable and had no money, and the woman nagged at him. The court dismissed his application and, in the logical sequence of events, his execution seemed likely, but at the eleventh hour the "proper authorities" find he is insane after all.

Vent's case admirably illustrates the fundamental difference between the legal and medical views of insanity in relation to criminal responsibility. Expressed quite crudely, the legal view suggests that Vent was 100 per cent. sane in the middle of February and 100 per cent. insane in the middle of March, that to the legal eye there were no visible gradations between these points, and that his condition in March throws no light on his behaviour and responsibility a few weeks earlier.

The medical view, as put to the Atkin Committee after the case of Ronald True, is far wider. It sees unsoundness of mind not as merely an intellectual disorder but as a morbid change in the emotional and instinctive activities, developing perhaps for years without objective symptoms until at last the manifest signs of delusions, mania, melancholia, or dementia are exhibited. A criminal court asks what degree of disease of the mind will negative criminality. This is a legal question, to be answered by medical evidence. The medical view has widened with more scientific study; the legal view remains where the judges put it nearly a hundred years ago.

UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

ANTITOXIN SCANDAL

THE distribution from the Gilliland Laboratories of more than a thousand ampoules of diphtheria antitoxin after the expiration date has caused a grave scandal in Pennsylvania. Suspicion was first aroused in the mind of a practising physician, Dr. Rynkiewicz, when an ample dose of antitoxin administered in good time failed to save the life of a five-year-old boy. He examined the package, and concluding that the expiration date had been interfered with, sent a warning to the State health department. Unluckily, a new political party assumed power just at this time, and following the lamentable custom so prevalent in this country, new political control means in Pennsylvania new public health officials. In the turnover Dr. Rynkiewicz's warning was overlooked. Later the same doctor was called in consultation to a diphtheria case in which Gilliland antitoxin had been used without the expected effect. Dr. Rynkiewicz gave antitoxin from another biological supply company, and this patient was saved. A fatality in the State capital (Harrisburg) brought the matter at last to the attention of the authorities. Inquiry showed that an official in the State health department, and ex-employé of the Gilliland laboratories, had satisfied himself after testing four samples that the "expired" antitoxin was still potent, and authorised the manufacturers to repackage and distribute it. The president of the Gilliland Company is now under arrest, as well as his incautious adviser. Hundreds of telegrams have been sent out recalling the impotent antitoxin, which will be replaced at the State's expense.

PUBLIC HEALTH

The report of the Surgeon-General for the fiscal year 1934, ending June 30th last, is now published, and relates in 136 pages an astonishing amount of activity by the federal service. The death-rates still show no signs of having been effected by depression. Rates were lowered to new records for diphtheria, tuberculosis, and typhoid fever. Birth-rate and infant mortality both declined. Quarantine activities have been increased by the necessity of controlling air traffic; 15,007 vessels and 3668 aeroplanes with passengers and crews were inspected during the fiscal year. Under the Administration's schemes for relieving unemployment, more than 6000 miles of drainage ditches have been dug for the control of malaria, and more than 225,000 sanitary privies built. Pellagra has declined throughout the years of depression.

Turning from the fiscal to the calendar year 1934 we have some indications of mortality trends from the insurance companies, whose figures are always the first to be made available. Dr. R. A. Fraser, of the New York Life Insurance Company, predicts that the mortality-rate will be slightly higher in 1934 than in 1933, but nevertheless one of the lowest on record. The Metropolitan Life Insurance Company, reporting on the basis of experience with its many million industrial policy holders, is even more optimistic. A new low mortality record is established by 1934, the rate 7·87 being 2 per cent. lower than the previous low record of 1933. The expectation of life of the company's industrial policy holders has increased from 46·63 years in 1911 to 59·19 years in 1933. The death-rate from alcoholism in the first full year since repeal is unchanged. Among white policy holders deaths from automobile accidents increased by 7·7 per cent. It is estimated that close upon 35,000 people lost their lives in the country as a whole from this cause last year. The increase in automobile fatalities and a decrease in suicides are both attributed to industrial recovery.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

PROSTIGMIN IN MYASTHENIA GRAVIS

THE successful use of Prostigmin in the treatment of myasthenia gravis makes it relevant to recall that the discovery which made it possible to synthesise drugs of this type was made in Edinburgh some nine years ago by Mr. E. Stedman, D.Sc. I am led to tell the story of this discovery in some detail in view of Mr. Bayley's letter in your last issue.

In an attempt to elucidate the relationship between the chemical structure and the pharmacological properties of physostigmine Mr. Stedman, working in the medical chemistry department of Edinburgh University, synthesised a number of relatively simple compounds in which certain features of the physostigmine molecule were reproduced, and demonstrated that these synthetic substances resembled the alkaloid in myotic properties.[1] Subsequent papers on the same theme by Mr. Stedman and his collaborators[2] established the generalisation that any substance which could be classified as a substituted phenyl ester of a substituted carbamic acid, or of carbamic acid itself, and which also possessed a basic group, would in general exhibit physiological properties analogous to those of physostigmine. This achievement paved the way to the systematic investigation of urethanes of this type, with a view to their therapeutic application,

[1] Biochem. Jour., 1926, xx., 719; 1929, xxiii., 17.
[2] Jour. Chem. Soc., 1929, p. 609, and 1931, p. 1126; Jour. Pharm. and Exp. Therap., 1931, xli., 259.

and such an investigation was in fact carried out by J. A. Aeschlimann and M. Reinert [3] in the laboratories of Messrs. Hoffmann-La Roche and Co., resulting in the production of prostigmin.

The association of Mr. Stedman with the subject is, however, by no means confined to the discoveries I have outlined, for he and his co-workers, amongst whom Mrs. Stedman must in particular be mentioned, have shown that their synthetic urethanes share with physostigmine the property of inhibiting the action of liver-esterase.[4] They have, moreover, demonstrated that this particular enzyme is without action on acetylcholine, and have proved that the destruction of this important substance in the body is brought about by an enzyme elaborated by the organism for this specific purpose. Because of its specificity, coupled with the fact that it hydrolyses other esters of choline, they have named this enzyme choline-esterase.[5] In the course of this work Mr. and Mrs. Stedman have elaborated a chemical method for the determination of choline-esterase, have measured its relative concentration in blood-sera from various species, and finally, have gone far towards effecting its purification.

HOMŒOPATHIC TREATMENT IN FEVER HOSPITALS

Dr. H. Henderson Patrick, president of the British Homœopathic Congress in 1933, recently suggested that he and his colleagues should undertake the treatment of patients in 40 to 50 beds in one of the Glasgow fever hospitals for a period of six months, "in order to demonstrate the advantage of homœopathic methods." He claimed that by the adoption of homœopathy the city would save at least £131,000 per annum on the treatment of notifiable diseases alone. The health committee of the Glasgow corporation considered this proposal, but decided by a majority to recommend that no action be taken. Last week the corporation debated the proposal at length, and finally decided by 44 votes to 40 that the decision whether a test of homœopathic methods should be made should be left to the medical officer of health. It was pointed out during the discussion that the corporation could not dictate to the medical officer the treatment that should be given in the fever hospitals.

CRIMINAL LUNATICS

In Scotland criminal lunatics are at present detained in a part of Perth prison known as the Criminal Lunatic Department and State Institution for Defectives. The buildings of this department are antiquated and quite unsuitable for the modern treatment of the inmates. In order to overcome these shortcomings the Criminal Lunatics (Scotland) Bill was introduced in the House of Lords last week. Under the provisions of the Bill the Secretary of State for Scotland is authorised to order the acquisition of land, the construction and equipment of buildings, and the appointment of a resident medical superintendent and such other officers as may be considered necessary. An advisory committee, consisting of not less than three and not more than six persons, would be appointed to advise and assist in the management of the asylum. It is hoped that the Bill will become law this session, so that immediate steps may be taken for the erection of the new buildings. It is proposed that the new institution should be built near Carstairs in Lanarkshire.

CARNEGIE UNITED KINGDOM TRUST

The Earl of Elgin outlined the policy of the Carnegie United Kingdom Trustees for the next five years at the twenty-first annual meeting of the trustees held in Dunfermline. The allocations include £150,000 for the development of land settlement, £70,000 for libraries, £30,000 for the encouragement of choirs and groups of instrumentalists, £25,000 each for social services for young people and for village halls, £20,000 for a new experiment in educational work for young people between the ages of 18 and 21 years, and £16,000 for general extension work by the National Council for Social Service. During the lifetime of the Trust £2,528,000 has been distributed throughout the United Kingdom. The progressive policy of the trustees is being worthily continued.

[3] Jour. Pharm. and Exp. Therap., 1931, xliii., 413.
[4] Biochem. Jour., 1931, xxv., 1147; 1932, xxvi., 1214.
[5] Ibid., 1932, xxvi., 2056; 1933, xxvii., 1055.

STERILISATION WHILE YOU WAIT

THE Wardour Films Ltd. invited members of the medical profession to a special show at the Rialto Theatre on March 13th of a film entitled "The Unborn," which, to use the words of the invitation, "shows for the first time the value of sterilisation and at the same time some of its most glaring faults as a measure for the betterment of the human race." The hero of the film is a young assistant in an American surgical clinic. Let us call him Dr. X. He becomes interested in a family circle which consists of a workless man who has taken to drink, his wife who has just given birth to a stillborn child, a lad in prison, a crippled boy sitting on a mattress on the floor, and a young nitwit playing with whisky bottles also on the floor. The only bright spot in this family is a young woman earning good wages who practically keeps the menage running. Thinking to befriend this girl Dr. X reports the family to the public health authority, which at once takes action and sends down a woman investigator, who readily obtains the wife's consent to a wholesale sterilisation of the household, and the man's consent reluctantly on the threat of withdrawing the promised financial assistance. In a trice every member of the household is haled away for care, treatment, or supervision, including the competent girl who is to be sterilised on account of her bad heredity, in spite of her resistance, as she is betrothed and ardently desires children of her own. But short work is made in court of her objection and the law is to take its course. There follows a thrilling scene in hospital when in succession three persons come into the operating theatre. The first with his high cheek-bones and unkempt beard excites no sympathy even when handcuffed before entering the theatre. The second is a young man with an evident grievance against society, but far from feeble-minded, who is entirely satisfied when Dr. X makes clear to him the nature and purpose of sterilisation, for he is interested not in procreation but in potency, and when on the table confides to one of the assistants that the operation will give him freedom to pursue his attack on conventions. These are vasotomies done under local anæsthesia. The third subject is the unwilling girl who is to have salpingotomy under general anæsthesia. Both she and Dr. X protest at every stage, and the latter is dismissed from the theatre by his chief, which gives him the opportunity of paying a lightning visit to the girl's mother, who is drunk enough to admit (what is to her a guilty secret) that the girl is not her own but was adopted at six months. With incredible swiftness the information is put through the judge and ultimately reaches the surgeon as he is about to make the inguinal incision. The girl springs from the table and joins her fiancé at the hospital door, where they go at once to get married. The film is remarkable for the accuracy of its surgical technique and of the technical information it gives about sterilisation. Its sociological value is diminished by the fact that compulsory sterilisation is not a practical issue in this country.

CORRESPONDENCE

THE PROBLEM OF DIPHTHERIA

To the Editor of THE LANCET

SIR,—In a valuable contribution to your journal (Jan. 19th, p. 172) on the problem of diphtheria, two statements are made which I should like to recall—

(1) ". . . while artificial active immunisation is an almost absolute protection against clinically recognisable diphtheria, it has no effect whatever in preventing subsequent carrier infection; at the same time and place the virulent carrier-rate is just as high among the artificially immunised as among those with natural negative Schick tests" and ". . . an increase in the carrier-rate has been shown to have followed the artificial immunisation of at least one institution."

(2) In the next paragraph the evidence of E. S. Godfrey is quoted to the effect "that the incidence of diphtheria in all of ten American towns did not fall, even after 50 per cent. or more of the school-children had been immunised; directly 30 per cent. of the pre-school children had been protected, diphtheria practically disappeared."

If the matter is carefully considered there is a certain contradiction in these two statements. If, after a large amount of immunisation has been carried out in a community, the number of carriers remains as large as before, or even increases, and, further, the carrier is the principal source of infection, then the effects just quoted from Godfrey in the final subsentence should not follow. Other things being equal, the unimmunised portion of the population should continue to suffer from an incidence of diphtheria comparable to, or even greater than, that from which they suffered before the immunisation was carried out. Godfrey's work is of so excellent a character that the evidence for the maintenance of a high carrier-rate following upon inoculation and for the effectiveness of carriers requires the most careful investigation.

The evidence as to the continuance of high carrier-rates in inoculated communities is certainly not unanimous. Thus, W. J. Deadman and F. L. Elliott (Canad. Pub. Health Jour., 1933, xxiv., 137), from their experience in Hamilton, Ontario, found that carriers became scarce after a campaign of inoculation, and that the bacilli isolated were generally avirulent. The reference in THE LANCET article to "an increase in the carrier-rate . . . of at least one institution," presumably relates to the Greenwich Hospital School, the circumstances of which have been detailed by Dudley, May, and O'Flynn in their report (1934) to the Medical Research Council (Spec. Rep. Series No. 195). This report is the fruit of many years' labour, and is one of the most valuable contributions to the subject which has been made. Produced under the ægis of the Medical Research Council it merits, and should receive, the most careful consideration; but the conclusion given on page 43 of the report that "it becomes certain that the chief factor which caused an 85 per cent. increase in the frequency with which T.C.D. (Toxigenic *Corynebacterium diphtheriæ*) carriers were recorded in G.H.S. was the artificial immunisation of the school against diphtheria, assisted in greater or less degree by the introduction of a T.C.D. strain of more than average infectivity in 1932," in the opinion of the undersigned requires modification. After careful study of the report, I am forced to the conclusion, on the evidence of the report itself, that this rise was due to the introduction in November, 1932, of a gravis strain of bacillus into the school, and that immunisation probably had no relation to this rise in the carrier-rate.

It was fortunate that, shortly after the differentiation and description in 1931 by Anderson and his colleagues of the gravis, mitis, and intermedius strains of diphtheria bacilli, Surgeon-Commander O'Flynn typed the organisms isolated in the school, and his work was confirmed by Miss Orr Ewing.

During the first and second terms of 1932 there were 54 strains of mitis type (10 avirulent) and 3 strains of a typical gravis type; in the third term 1200 swabs were taken and 161 were positive, of which 13 were mitis (2 avirulent), 146 of typical gravis type, and 2 of intermedius. The epidemiological picture had changed with equal suddenness. An epidemic of sore-throat in September and October was followed by an outbreak of 18 cases of "modified diphtheria"—mostly very mild; as shown by Table III., the carrier-rates of T.C.D. rose to 12·8 and 13·7 per cent. in November and December respectively.

In the same Table the figures are given for the total carrier-rates before and after the introduction of immunisation into the school; these are given as $2{\cdot}7 \pm 0{\cdot}24$ and $5{\cdot}0 \pm 0{\cdot}19$ respectively, and it is on these two rates that the conclusion on page 43, already quoted, is based. We have, therefore, two events occurring in the school: (i) the introduction of inoculation; (ii) the introduction in November, 1932, of a typical gravis strain. In order to make a true comparison between the carrier-rates before and after immunisation, it is necessary to eliminate from the total after immunisation figures the swabs taken in the last quarter of 1932, and the resultant positive findings; this can easily be done. From the total number of "after" swabs, namely, 6354, subtract the number taken in the November and December of 1932, namely, 990; and from the total "after" positive findings, calculated backwards from the total percentage 5·0, i.e., 318, subtract the number positive in the last two months of the year, i.e., 141, similarly obtained by calculation backward from the percentages. The correct carrier-rate after immunisation and before the introduction of the gravis strain is therefore:

$$\frac{318-141}{6354-990} \times 100 \text{ or } 3{\cdot}30 \pm 0{\cdot}21.$$

The carrier-rate before immunisation was, therefore, $2{\cdot}7 \pm 0{\cdot}24$, and the rate after immunisation was $3{\cdot}30 \pm 0{\cdot}21$. The difference $0{\cdot}60 \pm 0{\cdot}32$ is not statistically significant. In other words, no significant rise of the carrier-rate occurred in the school until after the introduction of the gravis strain.

A further examination of Table III. shows that a rise in the carrier-rate to 11·2 occurred in March, 1932, associated with a mitis strain. An identical rise to 11·2 occurred in July, 1923, before inoculation. Apart from these two occurrences no rise in the carrier-rate to above 10 per cent. occurred in either the "before" or "after" inoculation series. We may conclude, therefore, that the carrier-rate at Greenwich Hospital School was almost identical before and after immunisation until a typical gravis strain was introduced in the autumn of 1932, when the rate rose to higher figures than had previously been recorded. This record of a rise in carrier-rates during the prevalence of a gravis infection is a most valuable contribution to epidemiology, but it has not been given adequate weight in the report; it is quite in accord with the experience of recent years in towns where gravis infections were prevalent.

The continued high carrier-rates in Greenwich Hospital School are probably to be associated with the overcrowding of the dormitories graphically shown in Plate II. of the report. As the Greenwich Hospital School has now been moved to new quarters it is to be hoped that the authorities of the school will continue these investigations so as to ascertain whether this alteration of environmental conditions will lead to any reduction in the carrier-rate. The experience in Liverpool, where the occupants of some 28 residential

institutions have now been perseveringly immunised, leads us to believe that, even in the face of a gravis epidemic, the carrier-rate of virulent organisms, apart from children who have had clinical diphtheria, is greatly reduced following upon immunisation.

The second point raised by the report relates to the efficiency of carriers, as against cases and missed cases of the disease, in transmitting diphtheria. J. A. Doull and H. Lara (Amer. Jour. Hyg., 1925, v., 529), as the result of investigations at Baltimore, found that a clinical case of diphtheria is approximately ten times as infectious as a carrier of the corynebacterium. The experience of many who have to investigate diphtheria in the field points to the mild "missed case" of diphtheria as being more efficacious than the carrier in the propagation of diphtheria. The words used by Jacobi in 1884, and quoted in my "Principles of Epidemiology," may be again quoted: "Many a mild case is walking the streets for weeks without thinking that some of his victims have been wept over before he was quite well himself." In the experience of many it is especially the nasal case, often with few symptoms, that is responsible for numerous other cases. Although such modified cases occur amongst inoculated, but not completely immunised, persons it has yet to be shown, and it is extremely doubtful, whether they occur more frequently among an inoculated population than in a population exposed to the full weight of the natural disease; if the evidence of Godfrey, and of Deadman and Elliott, is to be credited we must conclude that they do not.

I have endeavoured to show that the statements which are being freely made in various quarters that immunisation of a portion of the population leads to an increased spread in the remainder is based upon a narrow and very insecure foundation for so large a superstructure, and that the evidence to the contrary is considerable and must not be neglected.

I am, Sir, yours faithfully,

Liverpool, March 15th. C. O. STALLYBRASS.

THE PLACE OF SURGERY IN THE TREATMENT OF PEPTIC ULCER

To the Editor of THE LANCET

SIR,—I have read Mr. Walton's criticism of my address with interest, but having been through it again myself I can find no grounds for his lament that it is "an attempt to return to the former uncertain methods of dogma." It is rather an attempt to arrive at conclusions which can be based upon pathological reasoning, animal experiment, and collective statistics rather than on the opinion of the individual upon his own work. None of Mr. Walton's quotations are from the article to which he takes exception, but are to be found in a second paper on another subject, published in a different journal at a later date.

In my address in THE LANCET (Feb. 23rd, p. 419), I stated at the outset that I did not propose to consider individual figures. Such figures cannot be discussed; "you must take them or leave them," and an inquiry based upon them ceases to be a search for truth and becomes an exchange of compliments. Mr. Walton is rightly satisfied with his results after gastrojejunostomy, and will therefore continue in its practice. But the majority of the surgeons of my acquaintance, and their number includes acknowledged masters in their branch of work, are profoundly dissatisfied and passionately anxious to ensure that the next generation shall not see the tragedies which are cropping up to-day.

Two of Mr. Walton's observations betray an overzealous anxiety to support the cause of gastrojejunostomy. He suggests that the younger surgeons in England and America are condemning gastrojejunostomy without sufficient reason, because they have not watched their after-results for the necessary prolonged period. But surely the man who cannot learn from the mistakes of others will never advance surgery. A surgeon does not see his own failures in gastric surgery; they go to other and usually to younger men. When he retires from his hospital his unsuccessful cases do not follow him, or go to his successor on the full staff, but to the assistant surgeon at out-patients. If Mr. Walton will consult such surgeons, and the physicians who are interested in diseases of the alimentary tract, he will find that the abundant crop of jejunal ulcers which prompted my paper are largely the patients of surgeons who have retired from their hospital staffs, but whose work was of a standard that has not since been exceeded anywhere.

Again, he says that it would be wiser to teach when and how a gastrojejunostomy is performed. Mr. Walton knows that I am one of his greatest admirers as a technician. But to suggest that inefficient technique is a material cause of recurrent ulceration is to revive a long dead bogy, and to cast a quite unmerited slight upon the many eminent surgeons, the majority in Europe to-day, who have abandoned the operation.

This subject is too important to be dealt with on personal grounds. The failures of gastrojejunostomy are perhaps the most pressing problem in surgery to-day. Wherever I have discussed this matter I have heard the same view expressed, and it has been repeated to me in letters I have received since the paper appeared, many from men unknown to me personally. My address was an honest attempt to contribute to the solution of this problem; it was prosy and may have been mistaken, but it was not dogmatic. I am, Sir, yours faithfully,

Harley-street, W., March 18th. W. H. OGILVIE.

SODIUM CHLORIDE IN TOXIC DIPHTHERIA

To the Editor of THE LANCET

SIR,—I note with interest Dr. R. D. Lawrence's suggestion in your issue of March 9th that adrenal failure may play a part in fatalities from toxic diphtheria and that the administration of salt may be of value in the treatment of diphtheria.

About 18 months ago I was impressed by the similarity between the symptoms of diphtheria in the acute stage and those of Addison's disease in the stage of crisis. I commenced observations on certain blood features of diphtheria and found particularly that blood-serum sodium is always lowered in diphtheria: in severe cases the serum sodium may fall from the normal 140 milli-equivalents per litre to below 100 milli-equivalents per litre. For over a year, with the kind permission of Dr. Elliott, the physician-superintendent, very ill cases of diphtheria under my care in Ruchill Hospital have been given continuously per rectum a 5 per cent. solution of glucose in normal saline during the acute stage. On many occasions cases in which the prognosis was very poor have recovered and they have frequently escaped paralyses. More recently I have been giving ill patients a daily intravenous injection of 30 c.cm. of 5 per cent. hypertonic saline solution, with equally satisfactory results. One case passed through a stage of complete cardiac failure with the pulse-rate at 27 per minute for over a week and with general anasarca; he recovered completely with the exception of mild palatal and ciliary paralyses. Intensive salt treatment very often results in the production of mild œdema; the onset of œdema frequently coincides with amelio-

ration of the symptoms. Another fact that occurs to one is that those observers who have been using intravenous glucose solutions in diphtheria have usually been injecting a solution of glucose in saline; it may be that the good results they have achieved are due rather to the salt than to the glucose.

Finally, I should like to state that it is possible to demonstrate, post mortem, changes in the adrenal cortex and to a less extent in the medulla in patients who have died from toxic diphtheria. Recent work in Addison's disease suggests that the adrenal cortex may have a controlling influence on sodium metabolism. There is undoubtedly a disturbance of sodium metabolism in diphtheria, and it seems very likely that this upset is due to cortical adrenal dysfunction produced by the action of the circulating diphtheria toxin on the cortical cells.

I am, Sir, yours faithfully,

ALEX MACLEAN.

Ruchill Fever Hospital, Glasgow, March 14th.

PLASTER-OF-PARIS IN COLLES'S FRACTURE

To the Editor of THE LANCET

SIR,—In your issue of March 16th (p. 609) Mr. Blauvelt and Mr. Willway express surprise that plaster-of-Paris is so infrequently used in England for the fixation of Colles's fractures. I believe that the writers underestimate the popularity of this method in British clinics at the present day. Contemporary practice is of course always in advance of surgical writings. When in 1932 the subject of Colles's fracture was discussed at the centenary meeting of the British Medical Association, plaster-of-Paris had been used as a routine in my own hospital fracture clinics for some two years, although I did not emphasise this point in my contribution to the discussion, which is quoted by the above writers. For the past five years, both in hospital and private practice, I have used no other method of fixation and I can see no likelihood of ever returning to the use of splints.

It is unnecessary to reiterate the outstanding advantages of plaster which have been well described by Messrs. Blauvelt and Willway in their article. My experience convinces me that the plaster "gutter," accurately moulded to the limb, embracing the greater part of the circumference of the wrist and forearm, and held securely by a wet gauze bandage is safer (as regards swelling), more effective, and more artistic than a full plaster case applied by means of the ordinary plaster bandage. Furthermore, I consider that the minimum period of plaster fixation should be five weeks. If the plaster splint is discarded at an earlier date in fractures without displacement it is often necessary to substitute some form of strapping or bandaging in order to prevent œdema.

I am, Sir, yours faithfully,

Manchester, March 18th. HARRY PLATT.

TREATMENT OF APPARENT STILLBIRTH

To the Editor of THE LANCET

SIR,—The letters by Dr. Kenneth R. Smith and Dr. A. Turnbull in your issue of Feb. 9th (p. 347) on the treatment of apparent stillbirth were intriguing. While they obtained the desired result—a live baby—the methods used were, I think, fraught with not a little danger. They are to be congratulated on their good fortune. A more scientific way would seem to be by the use of a tracheal catheter as recommended by DeLee. After a little practice it is easy to insert one and with ordinary care and gentleness it is safe. This method of resuscitation has been used here for a good many years. It enables one to remove any mucus plug which may be obstructing the trachea, and allows the operator to expand the lungs directly. The CO_2 of his breath acts as a stimulant, as in Dr. Smith's case. In his case it was fortunate there was no plug of mucus in the trachea. Lobeline, metrazol, coramine, or some other respiratory stimulant is also of value.—I am, Sir, yours faithfully,

WALTER MCMANN,
Resident Obstetrician, New York Polyclinic Medical School and Hospital.

New York, U.S.A., Feb. 26th.

ATTENUATION OF MEASLES BY ADULT SERUM

To the Editor of THE LANCET

SIR,—In the spring of last year an attempt was made, in conjunction with Dr. Geoffrey Oates, the medical officer of health, to control or modify the course of measles among Paddington children. Your last issue contains an account of work on similar lines by Dr. Burnet in Glasgow, and your readers may like to hear of our experiences in London.

It is, I think, generally conceded nowadays that it is better to allow the school-child to develop a mild attack of measles, and so thereafter be permanently immune, than to ward off the attack completely by means of serum. Passive immunity lasts only a few weeks, and the child so protected is open to attack in the next epidemic.

Nearly all adults in urban populations have had measles in childhood, and it has been demonstrated that after recovery there remains in the blood, even after many years, a considerable amount of substance which is protective against the disease. It was therefore decided as an experiment to take a controlled area in Paddington, comprising 23 streets in the working-class neighbourhood of Clarendon-street, and as far as possible inject the contacts intramuscularly with blood from the parents. It was felt that this method offered many practical advantages in the treatment of these contacts. Convalescent serum is too scarce for extended use. If the parents were not ill at the time, one could afford to neglect the risk of conveying any other disease to the children, and also parents would not object to the injection of their own blood, whereas they might possibly object to the use of serum. No attempt was to be made to use this blood for children of other families, since this would entail very careful testing previously by a pathologist.

Convalescent serum from a recent case is, of course, relatively more potent, and whilst 5 c.cm. of this suffices in many cases, it is necessary to use 20–50 c.cm. of adult blood to get the same results. The amount to be used also varies according to the number of days which have elapsed since the contact was in touch with the patient. We therefore endeavoured to inoculate our contacts on the fourth day in order that less blood might be required. Two methods were used in obtaining the blood according to the amount required from the donor. Where there was only one child to be injected it was easy to withdraw 25 c.cm. or so of blood from the parent's arm and inject this intramuscularly into the child's buttock, putting half into each side. Where more blood was required, it was defibrinated by shaking in a suitable bottle.

The work of visiting cases and persuasion of parents to allow their blood to be taken was carried out industriously by an experienced sanitary inspector, Miss Newhall, but even so there were a large number of refusals and rejections, as shown in the accompanying Table. Thus there were 200 cases in the controlled area with 779 contacts. Of these contacts 597 had already had measles, and another

78 were too young. This left 104 possibles. Of these, in 35 a definite refusal was made to injections of any kind; 39 others pleaded illness or other excuse in the parents; and 8 parents were tuberculous. Only 6 were finally left for treatment. These were given 18–25 c.cm. of blood and 2 of them had modified attacks, while the other 4 were completely protected. This means that probably too much blood was given, unless of course these children were naturally immune. In the younger it was evident that not more than 10 c.cm. can be injected into each buttock; hæmatomata resulted but no untoward complications ensued in any.

CONTROLLED AREA FOR MEASLES INVESTIGATION FROM JANUARY TO AUGUST, 1934

Cases visited in controlled area	200
Contacts	779
,, inoculated	6
,, having already had measles	597
,, where father refused to have child treated	19
,, where both parents refused to have child treated	16
,, with tuberculous parents	8
,, where neither parent had had measles	3
,, where neither parents nor grandparents had had measles	1
Parents complicated with other diseases or *excuses*	39
Contacts under age	78
Cases with no contacts	8
Contacts who probably had had measles previously	4

The outcome of this work is disappointing in the sense that little positive good resulted, but it illustrates the difficulties of applying the new knowledge of measles in actual practice. I am not aware that observations of this kind have been made previously in this country in a working-class area.

I am, Sir, yours faithfully,

A. B. PORTEOUS, M.D. Lond., D.P.H.

St. Mary's Hospital, Paddington, W., March 14th.

ASCORBIC ACID AND INFANTILE SCURVY

To the Editor of THE LANCET

SIR,—I was interested in the account given by Dr. Bell in your issue of March 9th of the rapid disappearance of the symptoms of scurvy in an infant following the administration of synthetically prepared vitamin C. As far as I am aware, the claim that this is the first record of a deficiency disease cured by a synthetic vitamin stands, although I suppose there must be by now in this country several infants whose scorbutic symptoms have been dispelled by the use of pure ascorbic acid prepared from natural sources.

Another disease in which scurvy is a well-known complication is cœliac disease, owing to the difficulty often experienced in getting children with this condition to tolerate those foods which contain vitamin C, without provoking a dangerous increase in the diarrhœa which is so prominent a feature of cœliac disease. It has been my experience that pure ascorbic acid finds a most useful rôle here, since it is tolerated when fresh fruit juices have repeatedly caused an exacerbation in the child's indigestion. This is illustrated by a child who was admitted to hospital when nineteen months old on account of severe cœliac disease, and who was quite unable to tolerate even small doses of fruit juice. From last September until the present time the only source of vitamin C supplied to her has been a 5 mg. tablet of Ascorbic Acid (B. W. & Co.) given once a day. Otherwise the diet has consisted chiefly of skimmed boiled milk, sherry, whey, meat broths and jellies, chicken, fish, raw meat sandwiches, and an occasional rusk, together with a few drops of irradiated ergosterol daily. It is most improbable that the child could have survived on this diet for six months without developing scurvy, and yet a dose of 5 mg. of ascorbic acid once a day has effectively prevented any trace of it.

I am, Sir, your faithfully,

London, W., March 15th. WILFRID SHELDON.

QUININE PROPHYLAXIS IN MALARIA

To the Editor of THE LANCET

SIR,—My personal experience with quinine as a prophylactic may interest your readers. In 1903 I spent ten months in the Bishnauth district of Assam, which at that time was notoriously malarial. I took five grains of quinine three times a day during the whole of my stay, and of the thirty Europeans in my district I was the only one who did not go down with malaria. The quinine did not affect me in any appreciable way. During the war I had to go to Rosetta on duty and was badly bitten by mosquitoes. Rosetta was reputed to be an extremely malarial town. For three weeks thereafter I again took fifteen grains of quinine a day. No malaria developed.

I am, Sir, yours faithfully,

London, W., March 18th. H. WARREN CROWE.

To the Editor of THE LANCET

SIR,—With reference to Dr. Lyndhurst Duke's letter in your issue of March 9th, which I have read with great interest, I would like to state very shortly the conclusions arrived at on the subject of quinine prophylaxis in malaria based on an experience of nearly fifteen years in a highly malarious district in Assam. In this particular area, where I was in medical charge of a number of tea-estates with large coolie labour forces attached to each, subtertian malaria was widespread throughout the population, and cases of blackwater fever amongst Europeans of not infrequent occurrence.

The accepted custom originally was to administer quinine as a prophylactic, five grains daily in tablet form to each working coolie on the different estates, quinine parades for the purpose being regularly held. The cost of the drug used in this way was extremely heavy, and the expenditure as I was able to show later so much waste. As a means of controlling the incidence of malaria this procedure was not only useless, it was indeed harmful, for it was relied on and led to the neglect of measures which should have been obviously more efficient. The incredible amount of money spent on quinine tablets left little or nothing over for any other prophylactic method. When, however, the use of the drug in this fashion was abandoned, satisfactory results began to be obtained from three main methods substituted for it—viz., anti-mosquito work, efficient and follow-up treatment with quinine of each individual case of malaria as it arose, and the paying of special attention to the treatment of children, always in malarious areas the reservoirs of infection.

But all this is not to say that one was led to discredit the value of the daily prophylactic dose of quinine in its proper place. On the contrary, from I think lengthy experience I am convinced of its utmost value, in fact of its necessity, for Europeans who live and work in regions where subtertian malaria is rife. True it cannot ensure against malaria infection, but I confidently assert that it reduces the incidence of attacks, and in addition, what I think is of great importance, I never saw blackwater fever arising in anyone who regularly and conscientiously took

quinine. In the intensely malarious district I refer to, full of subtertian infection, blackwater fever occurred in Europeans, who in repeated attacks of malaria doubtless took quinine and that often in large doses, but dropped the drug prematurely and wholly when the acute attack was seemingly at an end—that is to say, blackwater fever arose in subjects of subtertian malaria wrongly or inadequately treated with quinine, and neglectful of it as a prophylactic, the actual attack being precipitated often by a chill or violent exertion.

What then is fundamentally the difference between the value of quinine as a prophylactic in the working coolie and in the European? The secret in my view lies in the intensity of infection. The European in the tropics or sub-tropics lives in far more hygienic surroundings than the native. His residence is set apart from villages or coolie lines, with corresponding limitation of heavy mosquito infection. His house or bungalow is screened or partially screened, and he sleeps regularly under an efficient mosquito net.

I have never observed any sort of ill-effect from the regular administration of quinine in either sex or at any age, even over prolonged periods. Truly, quinine may be a protoplasmic poison, but like another and more popular agent credited with the same evil it must often take a very long time to work its mischief.—I am, Sir, yours faithfully,

Newport, Mon, March 12th. CHARLES E. P. FORSYTH.

A STANDARD FOR STRETCHERS

To the Editor of THE LANCET

SIR,—I should like to support the plea of Dr. L. P. Lockhart for a standard stretcher. There is no doubt that the countless variations in stretcher patterns do cause unnecessary suffering to patients. In planning the new casualty department at this hospital this point has received very careful consideration and we have endeavoured to evolve a stretcher trolley that will take any of the stretchers we are likely to have to deal with. This has presented a good deal of difficulty and expense which is quite unnecessary. Although I think that we have produced a design that will meet the case, I hope that stretcher manufacturers will take note of Dr. Lockhart's letter.

I am, Sir, yours faithfully,

H. TRUSSON,
House Governor and Secretary, Royal South Hants and Southampton Hospital.

March 8th.

FRENCH VITAL STATISTICS

To the Editor of THE LANCET

SIR,—Dr. Roubakine's views, reported by your Paris correspondent, are very interesting, but seriously misleading on one point. As the age constitution of the population may differ greatly from country to country, mainly because of the different fertilities, the health of nations cannot be compared by reference simply to their crude death-rates. A more reliable test is to compare the figures obtained by adding the birth-rate to the crude death-rate. But better still is a comparison of the mortality in the different age-groups; and if Dr. Roubakine were to make this he would find that, on the whole, France stands superior to Italy and only a little inferior to England. As to natality, it is true that the birth-rate in France is now higher than that in Sweden, Germany, and England; but, as it is below 17 per 1000, one is not justified in saying, even in jest, that "the French are still conscientious followers of the injunction to multiply and replenish the earth."

I am, Sir, yours faithfully,

Manor Fields, Putney, S.W., March 9th. B. DUNLOP.

LETTSOM'S PEDIGREE

To the Editor of THE LANCET

SIR,—I was much interested in your report of the 161st anniversary dinner of the Medical Society of London. As a great-great-grandson of Dr. Lettsom, will you allow me to correct two errors in it. Edward Lettsom, the imbecile, was Dr. Lettsom's son, and survived him. The doctor's fellow twin was another Edward. Eliza Lettsom married my great grandfather, John Elliot, F.R.S., *not* doctor. Perhaps the thermometer mentioned was used in Dr. Lettsom's greenhouses at his villa in Camberwell. Dr. Johnston Abraham's excellent biography of Lettsom contains many interesting particulars both of himself and his family. I am, Sir, yours faithfully,

March 18th. J. H. A. ELLIOT.

BRITISH SOCIAL HYGIENE COUNCIL

To the Editor of THE LANCET

SIR,—This year has seen the launching of a number of appeals to public benevolence on behalf of various useful and desirable institutions and objects. One of these has a special medical interest and importance, and we ask the courtesy of your columns to say a word in its support, and to bespeak for it the sympathy and encouragement of the profession.

The British Social Hygiene Council is this year celebrating its 21st birthday, and the completion of a period of National public service of no ordinary merit. It came into being to fight the scourge of the Venereal Diseases, whose appalling ravages were disclosed, to the surprise and alarm of the public (and even of the medical profession), by the Royal Commission of 1916 and by the Army Medical Reports. Repeated tributes to the educational part played by the Council in the success of the treatment centres, set up by the Government and the local authorities, have been paid in the highest medical and administrative circles. This vital educational work is still needed if the progress made in the years immediately following the war is to be maintained. A heavy toll of private tragedy and public expenditure is still being paid.

In the further pursuit of its objective, the Council (which has been fortunate in the number of distinguished laymen and medical men and women who have directed its efforts) extended its scope in 1925 to include positive health teaching for the younger generation, and for those responsible for its training either in schools or in youth organisations. This work has revealed a vast need (not being met otherwise) and awaits an expansion amounting to urgency, with which the present financial resources of the Council cannot cope.

H.R.H. the Prince of Wales has brought before the country the supreme importance of safeguarding the health and welfare of our young people. These young people—if they are to come safely to manhood and womanhood in the difficult conditions of to-day—must be given knowledge of themselves and be impressed with the importance, for the individual and the community, of the control of the racial instinct. We know of no organisation so well qualified in its policy, its personnel, and its equipment to help those who are undertaking this great National service.

The Council's achievements are not confined to these islands, but have Empire significance, and, in India and the Colonies, much-needed stimulus has been given to hygienic progress.

Wherever it is possible, therefore, we would ask for the coöperation of members of the medical profession in ensuring the success of the appeal for

funds made by the British Social Hygiene Council to enable its important educative work, particularly amongst adolescent youth, to be continued and developed along the broad National lines already planned by the Medical and Educational Advisory Committees of the Council.

We are, Sir, yours faithfully,

HORDER, MARGARET RORKE,
KENNETH WALKER, T. DRUMMOND SHIELS,
DAVID NABARRO.

Carteret House, London, S.W., March 18th.

THE NEED FOR MEDICAL PSYCHOLOGISTS

To the Editor of THE LANCET

SIR,—A leading article in your last issue emphasises the need for psychotherapy in the provinces and the difficulties in the way of providing it. No medical psychologist would doubt the justice of your conclusions, which my personal experience bears out. A few months ago I made extensive inquiries from medical and lay friends in three different provincial areas in the north of England. There, and less extensive inquiries in other centres showed that whilst the need for psychotherapy was accepted by physicians, surgeons, and gynæcologists, the difficulties of starting a practice were very great, requiring large reserves of money, patience, and courage. There are few or no openings upon hospital staffs, and local practitioners are still apprehensive of the psychological approach to psychogenic symptoms. The superintendents of provincial mental hospitals are in charge of the new out-patient clinics established under the Mental Treatment Act of 1930. A large proportion of these patients are suffering from psychoneuroses, and the physicians and their assistants are seldom able to give the time that such cases require to ensure satisfactory results. Many neurotics are with difficulty persuaded to attend these clinics because of their connexion with a mental hospital, and practitioners are tardy in urging attendance upon persons suffering from what may seem minor disorders but are in reality so disabling as to be a heavy charge on national insurance.

Superintendents of mental hospitals would not, in my opinion, be unsympathetic towards the appointment of psychotherapists who are fully trained and experienced, but something more tempting than present conditions will be necessary before they are forthcoming. If a well-equipped psychotherapist were attached to the out-patient clinic in several large towns on a half-time basis, adequate treatment of psychoneurotic patients would be ensured, and the experience of (say) three years' trial could be used for extending, modifying, or condemning the scheme. Section 6 (3) of the Mental Treatment Act enables local authorities to provide treatment as out-patients of persons suffering from mental illness, and salaried half-time posts would offer the pied à terre for private practice in the neighbouring district.

I am, Sir, yours faithfully,

Harley-street, W., March 19th. HENRY WILSON.

LILY-RASH VACCINE

To the Editor of THE LANCET

SIR,—Last October I published in your columns (1934, ii., 755) some evidence that lily-rash is a sensitisation disease which may be prevented by inoculating a vaccine from daffodil stalks. I should be extremely obliged if any of your readers who have been trying this vaccine would let me know: (1) the top dose—i.e., number of units—reached before picking started; (2) if protection was given, and if so, to any degree. I am trying to correlate reports from various users. There seems to be no doubt that inoculation does protect, but what dose is needed to give absolute protection has yet to be determined.

I am, Sir, yours faithfully,

Hayle, Cornwall, March 18th. W. H. PALMER.

PUBLIC HEALTH

Medical Members of L.C.C. Committees

AT the last meeting of the London County Council the personnel of the various standing committees was the subject of recommendations from the general purposes committee. Medical members of the Council have been nominated to serve on the following committees:—

Entertainments: Dr. S. McClements.
Establishment: Miss E. Rickards (chairman).
Fire Brigade and Main Drainage: Dr. McClements.
Hospitals and Medical Services: Dr. C. W. Brook, Dr. S. Monckton Copeman, Mr. Somerville Hastings (chairman), Dr. S. W. Jeger, Dr. F. Barrie Lambert, Miss Rickards, Dr. Henry Robinson, with the addition of Mr. H. L. Eason, not a member of the Council.
Housing and Public Health: Dr. J. A. Gillison.
Mental Hospitals: Dr. Brook and Dr. Robinson.
Parliamentary: Dr. Jeger.
Public Assistance: Dr. Barrie Lambert.
Public Control: Dr. Bernard Homa.
Town Planning: Dr. Gillison.
Welfare of the Blind: Dr. Brook (chairman).

Modernisation of Darenth

At a recent meeting of the London County Council an estimate was approved of expenditure amounting to more than £300,000 on the training colony for mental defectives at Darenth. Designed originally to accommodate children, its use for this purpose has long been decreasing owing to the diminution in the number of trainable defective children for whom the L.C.C. has to provide institutional care. The accommodation is now to be readjusted to meet the demand for beds for adult mental defectives; the number of these beds is to be increased from 1054 to 1518. At the same time the ward units will be reduced in size, the day-room space will be increased, and out-of-date structural details modernised. The plan also includes a new nurses' home and a separate villa for 64 intractable female patients.

Safe Milk at L.C.C. Hospitals

Several committees of the L.C.C. have been considering the report of the Economic Advisory Council on cattle diseases which was published about a year ago. In several ways this report touches closely on the work of the mental hospitals committee to whom the main question of interest raised by the report is whether pasteurisation should be enforced or whether the aim of milk producers should be to establish and maintain a clean herd. Experience of sampling and veterinary inspection of herds over many years has forced the L.C.C.'s medical officer to the conclusion that in spite of such measures it is under present circumstances impossible to ensure a tubercle-free milk supply even from tuberculin-tested cows. The mental hospitals committee is therefore constrained to admit that the only sensible

measure is pasteurisation, although this should not be looked upon as a substitute for the production of a clean milk-supply but only as a necessary auxiliary under present conditions. The L.C.C. has endorsed the recommendations of this committee and of the general hospitals committee to demand official approval of pasteurising plant and the standardisation of tuberculin testing. In other directions the report of the Committee on Cattle Diseases is not found to have the same application in London as in rural areas.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 9TH, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever 2733; diphtheria, 1509; enteric fever, 29; acute pneumonia (primary or influenzal), 1217; puerperal fever, 32; puerperal pyrexia, 115; cerebro-spinal fever, 25; acute poliomyelitis, 6; encephalitis lethargica, 9; relapsing fever, 1 (Chailey R.D., Surrey); dysentery, 21; ophthalmia neonatorum, 86; No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 16th was 3818, which included: Small-pox, 0 under treatment, 0 under observation; scarlet fever, 1150; diphtheria, 1764; measles, 11; whooping-cough, 275; puerperal fever, 34 mothers (plus 10 babies); encephalitis lethargica, 268; poliomyelitis, 2. At St. Margaret's Hospital there were 15 babies (plus 2 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including, London, there was no death from small-pox, 1 (0) from enteric fever, 11 (1) from measles, 6 (0) from scarlet fever, 18 (0) from whooping-cough, 51 (10) from diphtheria, 40 (13) from diarrhœa and enteritis under two years, and 139 (25) from influenza. The figures in parentheses are those for London itself.

There is a sharp rise in the number of deaths attributed to influenza, the totals for the last few weeks (working backwards) being 139, 83, 91, 83, 91, 71. This week these deaths were distributed over 55 great towns, Liverpool reporting 16, Stoke-on-Trent 9, Sunderland and Rhondda each 5, Sheffield and Southport each 4, Blackburn, Leeds, Birmingham, Nottingham each 3. Stoke-on-Trent reported 4 deaths from whooping-cough. Four fatal cases of diphtheria were reported from Sheffield, 3 from West Ham.

The number of stillbirths notified during the week was 268 (corresponding to a rate of 40 per 1000 total births), including 46 in London.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Rear-Admiral Guy L. Buckeridge, O.B.E., at present Deputy Director-General of the Medical Department of the Navy, whose appointment to succeed Surg. Rear-Admiral W. W. Keir, C.M.G., in charge of the R.N. Hospital at Haslar from May 1st was noted in this column last week, was medical officer during the war of the torpedo gunboat *Halcyon*, parent-ship at Lowestoft, and of the cruisers *Topaze* and *Dido*, serving as parent-ships to destroyer flotillas. In April, 1919, he was temporarily on the *Hecla* special torpedo vessel, and shortly afterwards became principal medical officer in the training ship *Impregnable* at Devonport. He was first appointed to the Medical Department of the Admiralty in 1922.

Surg. Capt. S. F. Dudley, O.B.E., M.D., to *President* for Medical Dept., Admiralty (April 24th), and as Deputy Medical Director-General (May 1st).

Surg. Capts. F. J. D. Twigg to *Victory* for R.N. Hospl., Haslar, H. E. R. Stephens to *President* for Naval Medical School, R.N.C., Greenwich, S. Bradbury to *Victory* for R.N.B., and H. St. C. Colson to *St. Angelo*.

Surg. Comdr. J. F. M. Campbell to *Drake* for R.N.B.

Surg. Lt.-Comdrs. E. C. Davis to *Ajax*, S. G. Weldon to *Queen Elizabeth*, J. C. Souter to *Achilles*, C. H. Birt to *St. Angelo*, H. J. McCann to *Dorsetshire* (on recommg.), R. L. G. Proctor to *Drake* for R.N. Hospl., Plymouth, D. Duncan to *Terror II.*, and J. M. Sloane to *Victory* for R.N.B., Portsmouth.

Surg. Lt.-Comdr. (D). J. T. Wood to *Victory* for Haslar Hospital.

Surg. Lts. J. L. S. Coulter to *Pembroke* for R.N. Hospl., Chatham, and R. M. Kirkwood, to *Dorsetshire*, on recommg., F. W. A. Fosbery to *Halcyon*, and A. Long to *President*, for three months' course.

ROYAL NAVAL VOLUNTEER RESERVE

Proby. Surg. Lt. (D) L. B. Hilton to be Surg Lt.

Proby Surg. Sub-Lt. P. M. Inman to be Surg. Sub-Lt.

Prob. Surg. Sub.-Lts. F. B. R. Bennett to *Renown* and G. S. Irvine to *Renown*.

ROYAL ARMY MEDICAL CORPS

Capt. J. T. Robinson is secd. for serv. under the Colonial Office.

Capt. H. L. Oldershaw, from Supp. Res. of Off., to be Capt.

Lt. G. L. Grieve, h.p. list (late R.A.M.C.), on completion of a period of five years on the h.p. list, retires on account of ill-health.

ARMY DENTAL CORPS

W. F. Finlayson to be Lt. (on prob.) and is secd. under the provisions of Art. 213, Royal Warrant for Pay and Promotion, 1931.

TERRITORIAL ARMY

Lts. H. E. Blake and F. L. Ker to be Capts.

S. B. Faulkner to be Capt.

C. K. D. Edwards to be Lt.

ROYAL AIR FORCE

Group Capt. F. C. Cowtan to Headquarters, R.A.F., Halton, for duty as Principal Medical Officer, vice Group Capt. B. A. Playne, D.S.O.

Squadron Leaders T. J. X. Canton to Station Headquarters, Farnborough, for duty as Medical Officer, and G. P. O'Connell to R.A.F. General Hospital, Palestine and Transjordan for duty as Medical Officer.

Flight Lts. A. M. Weston to Station Headquarters, Kenley, F. E. Lipscomb to R.A.F. Base, Malta, and F. H. Peterson to R.A.F. General Hospital, Palestine and Transjordan.

INDIAN MEDICAL SERVICE

The undermentioned officers retire: Lt.-Cols. R. B. S. Sewell, C.I.E., and F. Oppenheimer.

Lt. M. M. D. Chughtai resigns his temp. commn.

Maj. R. G. Dani retires.

COLONIAL MEDICAL SERVICE

The following appointments have been made: J. K. Monro, M.Chir., Professor of Surgery, King Edward VII. College of Medicine, Singapore, Straits Settlements; Dr. H. M. Johnston, Medical Officer of Health, Jamaica; Dr. G. R. Baxter becomes Medical Officer of Health, Gambia; Dr. W. E. S. Merrett, Pathologist, Nigeria; Dr. W. J. E. Phillips, District Medical Officer, Cyprus; Dr. W. H. Smith, Medical Officer, Tanganyika; and Dr. B. Spearman, Senior Medical Officer, Grenada.

ROYAL DEVON AND EXETER HOSPITAL.—Although last year the income of this institution was the largest it has ever received, its expenditure was also the heaviest on record, and the result is a deficit of £2400 on the year's workings. The foundation-stone of the new out-patients' department has now been laid. It will include a dental department, additional accommodation for maternity cases, and a new ward for young children.

ROYAL GWENT HOSPITAL.—The Royal Gwent Hospital, Newport, Mon, is making an appeal for £100,000. Its income has, since 1929, dropped by £9000 a year and it has an overdraft of £65,000. The number of patients increases annually and some of the departments and equipment should be brought up to date, while the provision of an isolation ward is an immediate necessity.

PARLIAMENTARY INTELLIGENCE

OSTEOPATHS BILL

Select Committee Inquiry

(*Continued from p. 652*)

WHEN the Committee resumed consideration of the Bill on March 15th, Mr. ST. JOHN RAIKES, counsel for the British Chiropractors Association, said that as the promoters were prepared to meet them in respect of the protection which they thought was their due, he did not think it would be necessary to proceed further with their opposition to the Bill.

Evidence of Dr. W. K. Macdonald (continued)

THE USE OF DRUGS

Dr. W. K. MACDONALD was further examined by Mr. THORPE, K.C., on behalf of the promoters. He agreed that there were some outstanding diseases that could be treated medically. Syphilis, for example, was usually cured by some arsenic preparation. Leprosy, amœbic dysentery, and all the intestinal parasites had their appropriate medical remedy. He would not look upon these parasites as respectable germs compared with the streptococcus, the staphylococcus, or the colon bacillus. He would not regard the amœbæ of dysentery as germs at all. Nor would he call the plasmodium which caused malaria a germ; it was really a parasite. Frequently in practice one met emergency cases where the patient was probably dangerously ill and something drastic and rapid had to be done. There were certain procedures which in such cases might save life. Under this heading he would include such things as diabetic coma, which was treated by large doses of insulin and glucose, and acute uræmia, especially in the child, which was treated by alkalis intravenously and perhaps by venesection. Thirdly, there was severe tetany which occurred after too energetic surgical removal of the thyroid. That was treated by giving subcutaneous injections of parathormone. There was also acute cardiac failure of the non-toxic variety, treated by venesection and strophanthin or digitalin intravenously. Then he must mention severe asthmatical seizure which could be treated by adrenaline with dramatic results. Lastly, he would mention the intravenous injection of saline under such conditions as general shock and loss of blood, with or without the use of morphia and atropine. These emergency conditions might occur under any system of practice (except perhaps the severe cases of tetany), no matter what method one was following.

Osteopaths, said the witness, admitted the usefulness of what he might call non-drug body remedies. He felt that medical men would like to include in the list he had given of medical emergencies such conditions as acute pulmonary œdema and toxic heart conditions, but he could not allow them to do so. He contended that in such acute cases general osteopathic treatment gave better results than could be obtained by digitalis, atropine, and morphia, though those drugs could and did save life in many cases.

The witness proceeded to deal with the question of sera. He said it was difficult to argue with a person who shut his eyes to the value of anti-diphtheritic serum. When he was a medical student the mortality was 30 per cent.; it was now 4 per cent. He agreed that a great deal of time and industry had been spent on serum therapy in the past.

COUNSEL: As a result of that work do you say that to-day it is possible to state the categories and results that have been worked out and are likely to be worked out?—WITNESS: That is a very big question, but I can give you what I consider the results which serum therapists are justified in claiming as outstanding. Proceeding, Dr. Macdonald instanced diphtheria serum, the alleged reduction in mortality in cerebro-spinal fever by means of Flexner serum, Wright's vaccine in a small number of cases of boils and acne, as well as other autogenous vaccines; and the immunity treatment of typhoid fever. The witness said that the comparative results of the South African War and the Great War made it perfectly impossible for any intelligent man not to accept that immunity treatment. Then there was the much disputed use of vaccination in small-pox. It must be admitted that as far as the prevention of small-pox was concerned there was a large amount of evidence which would indicate that other extraneous poisons were often introduced in the vaccination process. He would also mention the preventive and curative treatment of tetanus, and, lastly, the treatment of hydrophobia. This was not a very comprehensive list of serum therapy. He thought that the foremost workers in this field of therapy, including Ehrlich, the greatest of all, had realised that serum therapy had been worked out and were abandoning it.

Replying to questions by Lord DAWSON, the witness said he was not contending that the door had been closed.

Continuing his evidence, Dr. Macdonald admitted that medicine had its own field, and he paid a tribute to what medicine was doing and had done in the past.

COUNSEL: Have you heard it suggested that osteopathy is revolutionary, and is an attack on the medical profession and art?—WITNESS: I have heard that osteopathy is a revolution. Osteopathy is a revolution against drug giving as a universal therapy. It is not our purpose to attack the medical profession, except in so far as we think that the universal giving of drugs as a therapy is wrong.

The witness added that he thought that osteopathy would be judged in the light of a revolution as being good or bad according to whether its teachings helped or hindered the progress of the healing art.

A TYPICAL WEEK

The witness proceeded to give some details of the cases which he had treated in his practice during the week ended Feb. 9th, which he said was a typical week. During that week his assistant and he gave treatment to 59 patients—30 women and 29 men. That, he said, refuted the statement that their patients were mostly hysterical women. The ages of the patients varied from 6 years to 91, and the diagnosis of the cases was roughly as follows: curvature of the spine, 7; lumbago, 7; rheumatoid arthritis, 6; sciatica, 5; brachial neuritis, 5; heart disease, 4; accidents, 3; migraine (headache), 4; digestive troubles, 4; flat-feet, 3; mental cases, 3; deafness, 2; asthma, 1; diabetes, 1; epilepsy, 1; and influenza, 3. It would be noted, he said, that 30 of these cases suffered from pain, and were what might be called static cases, while 29 cases were purely medical conditions.

COUNSEL: Were you treating those cases as an osteopath or as a doctor of medicine of Edinburgh University?—WITNESS: I was treating them as an osteopath. I want to make this point perfectly clear. Since I returned to Edinburgh in 1912 I have never treated a patient medically, except during the war years, when I had to do surgery. I have never written a prescription.

The witness added that he had used such drugs as morphia for the removal of pain, and he had also used drugs such as omnopon and hyoscine, but only when he was treating a drug addict. In such cases he used these drugs to replace the drug for which the addict had a craving. In cases too of asthma he had switched the patient over to a less harmful drug such as ephedrine rather than stop using drugs altogether. He knew that most osteopaths stopped drugs altogether, but he found that he gradually broke the patient off using drugs if he substituted some less harmful one. Perhaps it was

the humanity in him that made him let them down easily.

Replying to Lord DAWSON, the witness said that personally he never used insulin at all, but he admitted that insulin was the best treatment in a marked case of diabetes with a very big sugar content. He was treating a patient now, and he would keep him off insulin. The patient was in a much better position than if he was dependent on insulin all his life, because insulin was bound in the end to lead to disease of the cell-islets of Langerhans in the pancreas.

In reply to Mr. THORPE, the witness said that he was looking and hoping for the cure in the patient's body, and not by importing some other substance. So long as the patient depended on insulin, they were saying to his pancreas, "Don't bother about dealing with sugar, I will do it for you."

EPILEPSY AND BROMIDE

The witness referred to the case of a child of six years who had epilepsy, and who had been on bromide and luminal since she was two years old. She was doped, he said, and of course the fits were kept under. When the child came to him first he stopped the bromide and the luminal, to see what number of fits she would throw. He was stopping the fits by treating the atlas, the axis, and the second and third dorsal vertebræ. Those were the only two places where osteopaths could get at the circulatory conditions affecting the brain. He found in this case structural abnormalities in keeping with the condition. The axis vertebra was rotated back on the right side forming a definite palpable thickened lump. The second dorsal vertebra had its spinous process slightly over to the left side, and the third dorsal vertebra had its spinous process definitely over to the right. There was no movement possible between the second and third dorsal vertebræ, and restricted movement between the first and second, and between the third and fourth. Following on his treatment, the child had given up taking all outside medicine. She was definitely better, and he was going to continue the treatment. He knew that he would get a good result in that case from his previous experience.

Replying to Lord DAWSON, the witness said that personally he did not use bromide in the treatment of epilepsy; he found that he could keep the fits down without it.

The witness told Mr. THORPE that he had asked 24 members of the British Osteopathic Association to send in some case reports, and he had over 300 cases, in the form of short reports, which were all substantiated, or could be substantiated by letters from the patients themselves. The reports contained cases of epilepsy.

BONESETTERS

The term "bonesetter" should in the witness's view be kept for unregistered persons who had a flair for manipulating bones and breaking down adhesions in a deft manner, often heriditarily acquired. He would not apply the term "manipulative surgeon" to any bonesetter, no matter how eminent he became. The term "surgeon" should be limited to medically registered persons.

But there is nothing in bone-setting, or manipulative surgery so-called, that is not included in osteopathy?—All this discussion in the press, especially about bonesetting being a good old English art and osteopathy being an extraneous invention, is in very bad taste, and quite apart from the main question.

Take the wonderful work done by Sir Herbert Barker. How would you characterise his work? Is he a bonesetter?—Yes, I think he is the most marvellous bonesetter. I have sent cases to Barker, especially knee cases. I can recall two if not three cases where I have failed, and I have sent them to Barker and he succeeded thoroughly. I think he is a most marvellous man.

But he is not an osteopath? He would not claim to be one?—No.

THE BRITISH OSTEOPATHIC ASSOCIATION AND THE GENERAL MEDICAL COUNCIL

The witness said he was a member of the British Osteopathic Association and was there as its representative. It had been necessary on several occasions to expel a member from the Association for unethical behaviour, such as advertising. A very high standard of ethical behaviour was insisted on. They could not compel anyone to join the Association, and there were persons outside the Association over whom they had no control. If the Committee passed the Bill, the Association would have disciplinary control over all the qualified osteopaths, and that was one of the main objects of the Bill.

Lord MARLEY: Can an osteopath put up a brass plate stating that he is a member of the Association?—WITNESS: I suppose he can. I only know we do not do it. We try to behave as decently as possible. We just have "osteopathic physician," or perhaps, "osteopath," or the name and "D.O." We encourage in the Association nothing more than that, but we print a directory of our members, with their names and addresses. That directory is the only way by which we can let the public know who are qualified osteopaths and who are not.

The witness added that there were five, perhaps six, members of the British Osteopathic Association who were also on the Medical Register. There were three Dr. Macdonalds one of whom was his brother and the other his cousin.

The witness said he had several times pictured himself dismissed from the Medical Register, but he comforted himself with the thought that the Council might say "you have been a bad boy," but could not take away his Edinburgh degrees. There was nothing in osteopathy to compel a man to do anything that would be looked down upon by the Council.

Lord ELIBANK: The General Medical Council would not act with the osteopaths in the way of anæsthesia, and so on?—WITNESS: That is an entirely different point. Though I have perfect liberty to do what I like in practice it does not in any way compel other medical men to look upon me as a fellow practitioner.

I understood that the General Medical Council did not countenance medical practitioners who helped osteopaths with anæsthetics.—No, but I am on the Medical Register and have that advantage. But sometimes I have actually had difficulty in getting the service I wanted for a patient merely because I was practising osteopathy. It is the individual action of the practitioner that determines the attitude of the profession to us. I have had difficulty in obtaining the services of a consultant and of a bacteriologist, although I am on the Register.

The witness then related an instance of his applying to a bacteriologist for the preparation of a toxin for the treatment of a patient. When the bacteriologist was informed that the preparation was for a patient and not for himself he said, "If it was for yourself, I would be glad to do it, but if it is for a patient, I would rather not." He (the witness) asked if it was because he was practising osteopathy that the bacteriologist refused this help, while admitting that it was good for the patient, and he said "yes." The bacteriologist said that there were others that would help him.

Mr. THORPE: It appears from that story that if anybody suffers it is the unfortunate patient?—WITNESS: It is the patient.

The witness next referred to the work of the Osteopathic Clinic Committee, and the treatment given to poor people at the clinic. There was a proposal to establish an Osteopathic College in London with a high educational standard, where the students could train from beginning to end, and physicians who wanted osteopathic training could get it. Informal meetings between six members of the British Osteopathic Association and six members of the British Medical Association had taken place, but that policy must come to a full stop until they saw where they were and were free from the inability to give to each

student a diploma that was a hall-mark. They had nothing to give to the students at the end of four or five years except the diploma of an unrecognised college.

Lord ELIBANK: If this Bill does not go through do your negotiations with the B.M.A. fall altogether to the ground?—WITNESS: No, we will still go on in the same way, but we will be sorry that the college we start cannot give a diploma which will carry with it a registered osteopathic hall-mark.

TRAINING AND STATUS

The witness maintained very definitely that a medical man could not possibly become even a baby in the osteopathic world under 18 months to two years training. Osteopathic treatment was an art, ever changing, ever evolving, and ever bettering in the profession itself and in the individual osteopath. He should be sorry to see medical men going to the college for a six months' smattering of manipulation. He would not have the basic principle of osteopathy. The legislative committee of the British osteopathic Association had supported this Bill and he was there representing them. The most important point was that it was in the interests of the public that osteopathy should be recognised. The high esteem in which it was held in this country was due to the work of persons who had qualified themselves to practise after four years of training in the recognised colleges—a course which had been found adequate for the purpose of training and educating the osteopathic practitioners. There were about 170 practitioners in this country, but there must be over 2000 persons who had little or no qualification whatever who practised, with possible danger to the public. These figures were his own estimate. If this Bill were passed, it would be very much better for the patient, who would know whether the osteopath was a registered osteopath. A great number of the public wanted osteopathic treatment and they should know who was qualified and who was not. There was a great risk in unqualified osteopaths dealing with certain cases. He had in his practice seen some cases where it would have been positively dangerous for an unqualified manipulator to handle them at all. There had been cases of tuberculosis or malignant disease of the spine or aneurysm of the aorta where manipulation would be exceedingly dangerous. There had been times when he had sent cases to the hospital merely after examination. He emphasised the importance of such particular cases, as the public should be safe in the hands of the osteopath. A second point was that registration was required for educational purposes and for the purpose of imposing standards of behaviour. Osteopathy was very much handicapped by not getting the services of registered consultants, radiologists, and so on, although there was nothing in the Medical Act to prevent it. There was nothing in this Bill which would compel the medical man to coöperate with the osteopath, though the Bill, or something like it, would provide a bridge. On the other hand, they must remember that osteopathic views on the causation of disease and their guiding principles and methods of treatment were at variance with the medical schools. They were at complete variance.

Lord ELIBANK: You say complete variance. You do not give drugs?—WITNESS: No, we pass them to the medical practitioners who give drugs.

Lord DAWSON: You have used morphine?—WITNESS: Yes, but the point is we do not wish to use drugs as a therapeutic treatment.

You use morphia for the relief of pain?—Yes.

In reply to Lord ELIBANK, the witness said he would take out the word "complete" from his previous answer, but he submitted that their views on the causation of disease and the principles guiding their treatment and the treatment itself were all at variance. In giving morphia to relieve pain he was not using it in the form of treatment. It had no effect on the disease. He gave it to relieve immediate pain, and not as a means of healing. He could only speak for himself, but as a general statement he had no use for drugs in treatment. He admitted that in matters of extremity he must call in specifics that he did not use. He thought the student in future should have some knowledge of those emergency cases to make himself a complete physician.

Mr. THORPE asked if it was thought desirable that the student should be taught anything about drugs. The witness replied that osteopaths were not wanting to be drug-giving physicians. They wanted to be recognised as drugless practitioners, but the Committee would see the difficulty they were in, just as the osteopaths saw the difficulty their medical friends were in. The medical people in America had conferences with the osteopaths who originally wanted to be simply manipulators. The medical men said they would not oppose the osteopaths' efforts to obtain legislation if they lengthened their course—from two to three years, then from three to four years as in 1914, and from four to five years as was happening now. They would then not oppose the practice of medicine as taught in the osteopathic schools. Evidence would no doubt be brought that osteopaths in America did use medicine and he wished to explain why. Dr. Still taught that drugs were wrong, but he taught his students how they could recognise a morphia patient. Two drugs in common use in America 60 or 70 years ago were morphia and strychnine, and he taught the students how to recognise them. That was then used as a standby by the osteopaths and it had grown since then. They had produced a text-book which dealt with drugs because in individual States when osteopaths went there they had to be complete physicians. That was the position now. In this country the osteopaths wanted some recognition, and did not want to become drug-giving physicians. They were willing to hand over any patient who required drug treatment to the proper person, but they must be trained so that they would know what drugs could do in those cases. If the Bill was not approved he did not expect that it would make any difference to himself personally, but he regarded it as a measure of justice and protection for the public. He had no axe to grind in coming there to give evidence. Osteopathy to him had been such a wonderful thing; he had seen so many things that medical treatment could not cover; whilst at the same time he had seen so much harm through unqualified treatment.

Dr. Macdonald Cross-examined

Cross-examined by Sir W. JOWITT, K.C., on behalf of the British Medical Association, Dr. MACDONALD said he disliked a number of minima being placed in the Bill, and agreed that it would be better to have a body of men who understood the subject instead of putting the educational system into a strait-waistcoat, but he pointed out that in every university they had in the catalogue the actual hours spent on individual subjects. He admitted that they were continually making new discoveries, and that these might necessitate longer study of particular subjects which would have to be dealt with later on by Parliament.

Speaking for himself and the British Osteopathic Association, the witness said there was no place in this country where they could get a training in osteopathy which would satisfy him. The British School of Osteopathy had been conducted by Dr. Littlejohn, and they all admired his efforts. It was an individual effort, and it had not yet been enabled to bring its educational standard up to the level they would like. Dr. Littlejohn never applied to the British Osteopathic Association for recognition of his school. He thought the school was the only one in England, though there were other correspondence schools.

COUNSEL: Your Association has made it quite plain that if they had their way in legislation they would legislate so as to prevent any unqualified people coming on

the Register at all ?—WITNESS: No. In the Bill there is a clause which allows a person who has practised osteopathy for three years to come on as a registered osteopath.

COUNSEL pointed out that osteopathic practice was very much wider than dental practice, and the possibilities or potentialities in the case of the untrained man were greater. Might not the untrained man come up against conditions he had not seen in the course of three years ?—WITNESS: Yes.

Therefore if you are to have all people who have practised osteopathy for three years without any qualification at all put cheek by jowl with the qualified people who, you assume, take five years to gain sufficient knowledge to become qualified, so far from protecting the public you are doing the reverse ?—We are putting them together as a preliminary to cleaning up the whole thing.

Do you contemplate that these *de facto* practitioners are going to pass an examination ?—No, I do not think so. I take it that the purpose of the Board that is constituted will be to put on the Register automatically all people who are detailed as No. 1 and No. 2, whilst in dealing with No. 3 they would have to discuss each individual applicant separately.

Mr. THORPE pointed out that the words in the Bill were "and in the opinion of the Board is a fit and proper person to be registered." The intention was that the Board should have complete discretion to arrive at a solution of the question whether anyone was a fit and proper person.

Sir W. JOWITT: If the main object of the Bill is to protect the public it seems to me that unless you are to have some searching examination the immediate effect of the Bill would be not to protect the public but the reverse ?—WITNESS: I do not see how that would be, because those people are doing their work whether they are on the Register or not.

You would not suggest that it would be right for the legislature to form a Register with regard to any healing cult ?—No. I think the State must be guided or driven by public opinion.

There are a great many healing cults in this country with regard to which you and I would agree that it would be quite inappropriate for the State to have a State Register ?—I think so.

And the only justification of the State Register is that the particular healing body has scientifically justified itself in public estimation ?—Yes.

And you would agree that it would be premature to ask for it before making good your scientific position ?—I would agree that it was premature, but we would go on working for it.

Would you accept the test of unprejudiced scientific men, or would you say you make your claim by vox populi ?—It is a very difficult question. I think we have the vox populi already. I do not think it would be very easy to get a scientific body of men who would be unprejudiced. I am sorry to say it.

I suggest that public opinion on scientific matters is worth very little ?—Yes.

There is no doubt that the great bulk of the scientific opinion in this country is against your claims ?—Yes, it seems so.

A CONTESTED DOCUMENT

Sir WILLIAM JOWITT was proceeding to put to the witness questions in regard to a statement in opposition to the Bill signed by about 800 people representative of various branches of science in this country, including 30 members of the Royal Society, when Mr. THORPE objected to anything being presented in the form of a petition unless the signatories be called as witnesses. Sir W. Jowitt said the procedure in this case was new, but surely it would be relevant in a debate in the Lords to say that there was a very large number of eminent scientific men who had no medical training at all who were against this Bill. The CHAIRMAN then asked what questions he wished to put to the witness about it.

Sir W. JOWITT asked the witness if it was not a fact that the vast body of scientific opinion, not merely medical opinion, but the opinion of scientifically trained people in this country, was against this Bill.—WITNESS said he contended that they had not taken the slightest trouble to find out what scientific work had been done by osteopaths. He thought that the vast majority of scientific opinion was against osteopathy.

Lord ELIBANK said it did not seem to him that a statement of this sort could be put in unless the witnesses appeared before the Committee.

Sir W. JOWITT said he would not have thought the Committee would wish 800 people to be called. If a witness such as Sir Farquhar Buzzard stated to the Committee that he had the support of 800 people, among whom were Fellows of the Royal Society and people who were not medical men, he did not think that could be objected to.

The CHAIRMAN said he thought that Sir W. Jowitt was quite right in his procedure.

OPINIONS ABOUT OSTEOPATHY

Sir W. JOWITT said that it was not only a matter of this country. He asked if it was not the case that so far as the continent of Europe was concerned osteopathy had no support at all.—Witness agreed, but he said the question of osteopathy had never been raised on this side of the Atlantic outside the British Isles. He added that he thought that he could produce more evidence to prove that the attitude of the medical profession to new developments was ultra conservative and retarded general progress than Sir W. Jowitt could produce evidence to the contrary.

(You must not ask me, Sir W. Jowitt interpolated, to say what I consider ultra conservative. I am sure I would agree with you.)

The witness said that even Lister was absolutely scorned and turned down by his own confrères when he attempted to bring in an idea which was new. The same was true of Pasteur, who was not a medical man. He got a belated medal from the Royal Society. Replying to further questions, the witness said that he did not blame the medical profession for wanting to have things proved to them, but osteopaths were not claiming registration on the ground that they had proved to the scientific world that their contentions were true. They were claiming registration for the protection of the public. They had never had an opportunity of putting their case in favour of the scientific aspect of osteopathy. He contended that there was a great deal of scientific evidence which had never been put forward at all to these authorities. He agreed that the claim which the osteopaths were making was a claim to treat all diseases, including acute cases, but he did not think that osteopaths in this country handled acute cases much. If they gave a man five years' training he ought to be allowed to do it. Osteopaths were competent to diagnose. They were not allowed to do major surgery. The students of osteopathy were taught major surgery up to a point, and he also admitted that up to a point a medical man should learn major surgery even though he was not going to practise it. A man might be qualified in medicine but not competent to be a surgeon. It might require anything up to ten years, including hospital experience, before a student was able to attend to major surgery.

THE EDUCATIONAL CURRICULUM

COUNSEL: You cannot have a person competent to deal with healing unless he has a good knowledge of obstetrics ?—WITNESS: But he will have that.

Though you are going to limit the field of activity of those people you would agree that that is no reason why you should limit the field of education ?—No.

You agree that your students should learn materia medica ?—I think a three months' course in materia medica is adequate. I do not know that a student should learn to make up prescriptions which he will never prescribe. The witness added that osteopaths did not want to bias the minds of the students as to taking sides before they knew enough. They were not setting up a rival school of healing, but only trying to meet the requirements of the moment.

What subjects now forming part of the medical curriculum can in your view be left out ?—Materia medica,

pharmacology, therapeutics. As to bacteriology, naturally we would pay less attention to bacteria as the primary cause of disease. We would study it less but would not leave it out. We would not teach practical bacteriology very much.

Don't you think it desirable that the students should know the generally accepted facts of bacteriology?—Yes, but that can be done in much shorter time than in medicine.

Lord DAWSON: You say that you would cut down bacteriology because it was not the primary cause of disease?—I do not mean that. We cut down bacteriology because it is not of such great importance to us as to medical men. We hold that we have another cause in the body itself and we work on that side of it. I think it a waste of time to spend all the time spent in the medical curriculum on bacteriology.

COUNSEL: Why do you say that?—Because we do not attribute to organisms the great importance attached to them by medical men.

The witness indicated that there were further differences between the education of the osteopath and that of the medical student. They would refrain from the practice of medicine to the extent of an equivalent amount of practice in osteopathy. He would not leave out the special clinical subjects like diseases of the skin, diseases of the eye, nose, throat, and ear; but these should all be taught from the osteopathic viewpoint.

A DEFINITION ASKED FOR

Sir W. Jowitt then asked Dr. Macdonald for some definition of osteopathic principle. Give me, he said, your definition with precise scientific accuracy of what is the basic principle underlying osteopathy?—WITNESS: The basic principle is that we rely upon the power that the body has to heal itself of its ills. I go that far and no further as a general statement.

Lord DAWSON remarked that that was the principle of the treatment side—not the causation side.

The witness agreed with counsel that the necessary steps were diagnosis of disease, consideration of the cause, and then consideration of the cure. Knowing the cause would help the cure.

In the course of further cross-examination the witness asked leave to alter his definition by saying that osteopathy was that system of healing "that places chief emphasis," and so on. He could not give any simpler statement of the basic principle. He had previously pointed out the important influence of structural integrity, and the fact that there was more than one factor in disease.

COUNSEL asked the witness whether, as far as germ diseases were concerned, he might take it that there was no difference between osteopaths and the medical profession as to the cause of disease.—WITNESS said they both admitted that there was an invasion by the germ into the human body, and a fight between them. The effect of the fight was the actual disease produced, and symptoms were produced by the body in its efforts to overcome the effects of the organism. Osteopaths held that there were many germ diseases which would not occur if the body was kept in a perfect osteopathic order. Instances of such diseases were measles, influenza, pneumonia, and tonsillitis.

You have said that measles, influenza, pneumonia, and tonsillitis are caused by some germ, yet you say that if the body is osteopathically sound those germs would not be able to produce the disease.—Certainly, I maintain that.

That is a far reaching discovery, is it not?—It is important.

Upon what evidence is that founded? Take measles.—WITNESS said that measles was not a good case for the argument. He did not think that the organism had been isolated. Pneumonia was a very good case in point. If they took a swab from the throats of all the people in that room they would find in about 12 per cent. the pneumococcus waiting there. They contended, however, that if a person was osteopathically sound the organisms would not get a chance to start. If he could go through that room he would be able to tell them who stood a good chance of getting pneumonia and who did not.

Sir W. JOWITT asked the witness what evidence he had to show that the pneumococcus would not attack people who were osteopathically sound.—WITNESS said he had no evidence that counsel would accept.

Does it come to this that you make this important statement and osteopaths have not a tittle of evidence for the statement?—WITNESS said they had only their individual clinical experience which had been collected in certain hospitals in the United States. In this country they had no evidence.

How far does your own personal experience enable you to say that the pneumonia cases you have treated have been confined to people who have been osteopathically unsound?—I would not put it so strong as that.

Then you have found in the course of your experience pneumonia in the case of people who were osteopathically sound?—No. I do not believe the osteopathically sound person exists.

Replying to further questions the witness said they must have an ideal of osteopathic soundness. It was possible not to have occupational distortions on one's body and so on which were osteopathic abnormalities.

"OSTEOPATHICALLY UNSOUND"

Sir W. JOWITT proceeded to quote from statistics given by a committee in the United States which that committee stated showed that about 80 per cent. of the children and young adults of the nation displayed poor body mechanics. He asked the witness whether it was not a fact that as people got older it was almost certain that they became osteopathically unsound.—WITNESS agreed that was so.

Then how can you suggest that the question whether a person is osteopathically unsound or not has anything to do with the causation of disease?—WITNESS said he thought that osteopathic lesions caused asthma. The evidence which they had of cases of asthma showed osteopathic abnormalities and lesions, and when those abnormalities and lesions were removed the asthma disappeared.

Is that the universal rule?—No, all varieties of schools of treatment have their successes and failures in asthma.

The medical men would claim a certain number of successes. Were the osteopathic successes larger or smaller than the medical successes?—Larger.

Have you any evidence of that?—We only get their failures. Osteopathy has won its reputation on treating the failures of the medical profession.

Sir W. JOWITT said the witness had mentioned the case of a doctor who had declined to make some culture for him. Was that not very uncommon?—Yes.

No one in the world can make doctors or lawyers associate with people if they do not wish to?—No.

But as a rule in your practice have you any cause for complaint about the way in which the medical profession have dealt with you?—I have gone through a very bad time.

Many of us have done that, but you have emerged?—Yes. I have always taken the knocks that came. The witness added that he had treated many doctors and their aunts and cousins.

Every doctor will admit, will he not, that osteopathic treatment in certain cases, manipulative treatment as done by men who understand the business, can be very beneficial?—I think there is no denying that doctors admit that osteopathy in certain cases is good, but it is those three words "in certain cases" that we object to.

DRUGS AGAIN

Replying to further questions by counsel the witness agreed that medical opinion, both in this country and abroad, had for several years set its face against indiscriminate drugging. He contended, however, that that was very largely thanks to the osteopaths. They had won that battle. Now they

had arrived at the second stage when they would like the medical profession to adopt their viewpoint in disease and make a closer approach to their methods.

COUNSEL suggested to the witness that it would be ridiculous to go off at a tangent and say that because they were not going to use drugs indiscriminately they would not use them at all.—WITNESS said he had never contended that. He had never heard Dr. Still say that never in any circumstances must drugs be used. He agreed, however, that Still himself never administered drugs. Osteopaths did not want to use drugs.

But you are driven to use them?—We are driven by the medical profession to use them. We do not want to use drugs. We want to stick to our mechanotherapy as such, but we admit that there are diseases which can only be cured by drugs, and we hand those cases over.

Sir W. JOWITT said the whole trouble in this Bill was that osteopaths were asking permission to treat, and to be recognised as treating, those very diseases.—WITNESS said he was only there to give evidence. He did not know anything about the political part of it. He was entitled to say that osteopaths did not wish to treat these patients with drugs, and they would only teach their students as much materia medica as was necessary to show the students what cases should be treated by drugs, and they were willing to hand those cases over.

But in this Bill you are asking to be recognised as fit to treat all diseases, and you recognise that there are a lot of diseases with which your treatment cannot cope.—I recognise that there are a few diseases with which we cannot cope so successfully as can be done by medical methods.

OSTEOPATHY AND CHIROPRACTIC

When the Committee met on March 18th Lord CARNOCK asked Dr. MACDONALD what was the difference between the doctrine of osteopathy and the doctrine of chiropractics. The witness replied that shortly the position was this. Both schools worked on the same spinal column abnormality, but osteopathy had proved that when a bone got out of place in the spinal column the effects of that displacement were not due to the direct pressure upon the spinal nerve emerging from the spinal column. The early osteopaths, before any scientific investigation was made, thought that was the case. The chiropractic theory was based on that erroneous conception which was still held and taught by them. The witness added that in addition the chiropractors did not recognise pathology, and any system of healing which denied the teaching of pathology was to his mind not sensible.

Dr. Macdonald's Cross-examination Continued

Sir W. JOWITT, continuing his cross-examination, pointed out that Dr. Still had intimated that anyone who used drugs forfeited the respect of himself and his school. Counsel asked the witness if he was not much too intelligent and scientific a man to accept that.—WITNESS replied that he was not. He believed that Still's teaching was the ideal. Medical progress had been retarded by ignoring the laws of physical science in investigating disease. Man was a machine and art was a crude imitator of nature. In that respect osteopathy was a step forward and was in keeping with the spirit of the age. The next step would be along the lines of electronic medicine, and it was not so far away. The question might be asked why they failed to recognise disease in its incipiency. His reply was that it was owing to the arbitrary domination of the cell theory.

Do you tell their Lordships that any intelligent man engaged in the healing art could possibly say to himself: "I will never use drugs"?—I cannot conceive in the light of our present knowledge any intelligent man making such a statement.

FINGER EAR SURGERY

Replying to further questions by counsel the witness said that he knew about the practice of finger ear surgery, but he did not practise it himself. The reason why he had given it up was because of its highly evolved technique which required a man to practice it as a specialty. He had found that in nerve deafness finger surgery did not get good results; in catarrhal deafness finger surgery had produced wonderful results; while in otosclerosis the results were somewhere between the two. He agreed that grave results might occur if the method was carried out by an unskilled person.

In answer to further questions by counsel the witness said that manipulative medicine, as opposed to manipulative surgery, had not been much practised in this country, except by osteopaths. Osteopaths were not allowed to attend the hospitals.

REFUSED ACCESS TO HOSPITALS

Replying to Lord ELIBANK, the witness said that even he, who possessed a medical degree, was debarred from attending the hospitals because he was an osteopath. He was merely allowed to go to a hospital during visiting hours as an ordinary visitor—not in his professional capacity.

Lord MARLEY: They would not consult with you?—No. This had occurred to him in more than one case, but he would prefer not to state the names of the hospitals publicly. The only body he could bring this matter before was the General Medical Council. He might be wrong, but he did not think that the Ministry of Health had any power over the hospitals he was referring to. They would tell the Minister to mind his own business. Governors of certain hospitals who were among his patients had raised the matter, but it was hopeless; the majority ruled.

PERNICIOUS ANÆMIA

Sir W. JOWITT asked the witness what he considered was the right treatment in a case of pernicious anæmia. The witness said that the right treatment osteopathically was first to look for any osteopathic trouble and then to remove it by manipulation, and to work on the nerve centres in the spinal column which they had proved by experiment in the laboratory to have an influence on the blood-cells of the body.

Lord DAWSON asked the witness if he knew that the view was taken that this was to a very large extent a deficiency disease, and that if that deficiency was made up by liver or the active principles from liver it was claimed that these patients were maintained in health.—Witness said he knew that was so.

You are legitimately taking the opposite view—namely, that by osteopathic treatment you can obtain results in the cure of pernicious anæmia?—Not the cure.

Do you claim that you can lengthen the lives of these patients by osteopathic treatment?—No, I only claim this. When a patient comes to me with pernicious anæmia I tell him first of all the seriousness of the condition, and that it is a so-called incurable condition. I advise him to take the liver treatment because of the work you have been describing and because that work has proved that liver given by the mouth does produce very definitely good results in pernicious anæmia. The giving of liver is only in keeping with our admission that in certain cases the products of the ductless glands are used by us.

COUNSEL asked if the witness had had success in treating pernicious anæmia merely by osteopathic manipulation.—I think I can justifiably say yes.

Do you say that you have cured cases of pernicious anæmia by osteopathic treatment?—No one has cured pernicious anæmia.

DIABETES, TUBERCLE, AND CANCER

The witness told Sir W. JOWITT that by manipulating the spinal column they could increase secretion of insulin in cases of diabetes. He had no figures to show the results of manipulative treatment

in cases of tuberculosis. The treatment by osteopaths and medical men was much the same, but the osteopaths got results by following natural methods.

Lord ELIBANK asked if the medical profession had any cure for tuberculosis.—They have no cure, but they should have.

The witness said that the cause of cancer was not known. He did not know what the osteopaths did in America with regard to cancer, or if they treated it by manipulation. He never did so.

OSTEOPATHIC STUDENTS AT MEDICAL SCHOOLS

The students of osteopathy, the witness said, could only be fully qualified to treat disease if and when this Bill became law and they got access to the hospitals. He thought that the osteopathic students would go to the medical schools. From their point of view that was an undesirable necessity, because they would rather have complete facilities for training their own students. But that could not occur at once, and they must make a modest start, and in the meantime they were willing or anxious that their students should, for the first two years, go to a medical school or university to learn anatomy, physiology, and perhaps pathology. The osteopaths had no dissecting rooms, and it would be of no use duplicating them. The practice of osteopathy would be held up unless they could get some such machinery as that contained in the Bill.

COUNSEL: Why should the students not qualify as doctors and then, if you like, take a post-graduate course and become osteopaths, as you did?—WITNESS: For the simple reason that it is unfair to make a man who wants to practice osteopathy spend seven or eight years in becoming a legalised osteopath. He was made a professor of osteopathy less than a year after going to an American university to study osteopathy.

See what your medical training had done for you.—No, I had a very receptive mind so far as osteopathy was concerned, and it must be remembered that I lived and studied with Dr. Still after he had given up teaching, and he showed me his methods. It was a most unpopular appointment, but Dr. Still was the great man there and his wishes went, and I was only made professor of osteopathy so that with my knowledge of his principles I might teach them.

The witness added that he had little doubt that for some time to come, if the Bill passed, men would do what he had done, and go through the medical course and then study osteopathy. But larger numbers of men would go to the osteopathic college only. He thought there was a risk that the medical profession would pick out of osteopathy what they considered to be good and useful, and that they would not teach their principles.

COUNSEL: My suggestion is that that is exactly what you have been doing. That you have, wisely and properly, put on one side the guiding principle which Dr. Still elaborated and laid down for the simple reason that no intelligent man to-day could possibly accept that guiding principle?—I have most definitely not done so. I found that medicine contained no basic guiding principle. I went to America and saw that osteopathy had a guiding principle, and—what the medical profession dare not deny—a practical method of putting that guiding principle into operation for the benefit of humanity.

You never do anything to assist the body to cure disease?—Yes, we do.

Then, if you do, you are not accepting the principle, and are paying lip service to the principle and in practice departing from it?—I most strongly protest. In the healing art there can be nothing absolute. It is not a question of science. Medicine is not a science, and osteopathy is not a science. I protest most strongly against the suggestion that in my sincere efforts along osteopathic lines I have anything to do with lip service.

TREATMENT OF TYPHOID

Asked whether it was right to say that in all cases of typhoid fever there was a lesion present, Dr. MACDONALD replied that they would find reflexly produced abnormalities to which osteopaths paid attention. That was based on the experience of osteopaths. They could not imagine a case of typhoid not producing reflexly abnormalities which osteopaths could deal with to the benefit of the patient.

Lord DAWSON observed that there were epidemics of typhoid fever that were found to be associated with particular forms of infection, such as infected milk. Through investigation of such epidemics a great deal of knowledge had been gathered about typhoid, and he desired to know whether the witness could produce evidence showing that he had investigated such cases from spinal lesions, and if so in what proportion were they found.—WITNESS said that as far as he knew the answer in regard to this particular question of typhoid fever was "No."

Therefore it is an assumption?—As far as typhoid fever is concerned, yes.

Lord DAWSON directed attention to a statement that many cases of typhoid might be avoided by osteopathic treatment if treated directly during the first week. He asked if that was easy to do.—WITNESS replied that it was done. He afterwards agreed that his personal experience was that they could not diagnose it until they had had sufficient time to enable the body to produce the chemical reaction.

Take a clinical picture of suspected typhoid. Does it amount to giving sufficient evidence to justify a competent opinion in the first week?—Certainly not. We can just speak of possibilities. Comparatively loose statements are made not only in osteopathic but in medical text-books.

THE QUESTION OF DIPHTHERIA

Mr. RADCLIFFE, K.C., referred to a former quotation from McConnell and Teall's Practice of Osteopathy that "the predisposing cause (of diphtheria) is the obstruction of the circulation of the pharynx and tonsils by subdislocation of the upper cervical vertebræ, and even the lower cervical and upper dorsal, and severely contracted deep muscles of the neck." He asked if that had been demonstrated.—WITNESS: That has been demonstrated from our osteopathic point of view. We have never found a case of diphtheria that had not those osteopathic accompaniments, some or all, named in that paragraph.

In reply to Lord DAWSON the witness said the osteopaths would welcome any form of test by which they could be judged in this matter.

Lord DAWSON observed that the witness would not make such important statements regarding predisposing causes without evidence.—WITNESS said he believed there was evidence. On being asked where they could find it, he said there would be two tests—one by X rays and the other would be to have an arranged experiment on a large scale. He had not the evidence, but he was in all sincerity submitting it as a practical proposition.

Lord DAWSON said that in the world of medicine and science they had to investigate their data first and then deduce conclusions from them. He asked: has investigation already taken place of a sound character?—WITNESS: I cannot give you details about it, and I submit that it is rather an unfair idea. The work of Jenner went on for 30 years before there was proof of his contention. Why should we be asked?

Do you agree that before scientific people make statements of great importance they should agree to make investigations along scientific lines?—WITNESS: I cannot give you figures relative to diphtheria alone. I have indicated that we have research work which will show you.

In reply to Lord CARNOCK the witness agreed that a person with no predisposing cause could get diphtheria by applying a culture. Such a person would be very much more likely to recover if there was no previous subdislocation of the cervical vertebræ. That was his experience.

Mr. BEVERIDGE, who appeared on behalf of the Scottish Colleges, intimated that he did not propose to ask any questions.

NATURE CURERS

Mr. R. O. JONES, representing the Nature Cure Association, asked if a nature cure practitioner would be prevented from registration, and Dr. MACDONALD said there was nothing in the Bill to interfere in any way with his activities. It only said that he could not hold himself out to be a fully-trained osteopath. If the effect was to stop nature curers practising as osteopaths, that would be a good thing.

Dr. Macdonald re-examined

In reply to Mr. THORPE, the witness said he did not think that osteopaths would get an invitation from the medical profession to go down to an epidemic of typhoid or diphtheria. He did not think that the bulk of medical practitioners could sit in the witness's chair and give demonstration and justification for all the diseases they treated.

The witness then submitted comparative statistics from a report of the medical and osteopathic treatment given in the County General Hospital of Los Angeles, which normally has 1666 beds. He claimed that in that hospital the figures showed that osteopathy was doing good work. With regard to the proposed osteopathic college, he said that if the Bill was passed and the college that had been started by Dr. Littlejohn was automatically brought up to the standard laid down in the Bill, this would most assuredly be acceptable to the British Osteopathic Association. If the Bill was passed the school authorities and the Association would be in complete agreement and willing to accept the standard laid down by the Bill. He thought it would improve the course if they added pharmacology and comparative therapeutics.

The witness then exhibited a number of X ray photographs illustrating spinal conditions of two patients treated by him. One was a girl who was suffering from digestive disturbance and menstrual trouble. All her trouble the witness declared was referable to a pelvic twist, which was shown in the photograph. The picture's of a young man's spine he exhibited as a very good example of an osteopathic lesion, and the perfect re-establishment of the joint.

That concludes the cross-examination and re-examination of Dr. Macdonald, but he will be further examined by members of the committee.

Before the adjournment Mr. DICKENS, on behalf of the British Medical Association, called attention to the report which had been submitted regarding the Los Angeles Hospital, and pointed out that the printed copy produced was published by an osteopathic association and had a partisan preface.

NOTES ON CURRENT TOPICS

New Criminal Lunatic Asylum in Scotland

IN the House of Lords on Thursday, March 14th, Lord STRATHCONA (Under-Secretary to the War Office) introduced a Bill to make provision for the establishment of a criminal lunatic asylum in Scotland.

The Bill was read a first time.

HOUSE OF COMMONS

WEDNESDAY, MARCH 13TH

Supply of Milk in Schools

Mr. RHYS DAVIES asked the Parliamentary Secretary to the Board of Education how many authorities in England and Wales were not yet supplying milk in schools, and which they were.—Mr. RAMSBOTHAM replied: According to the latest information in the possession of the Board, 130 local education authorities out of 316 in England and Wales do not themselves at present make provision for the supply of milk to children in public elementary schools under Sections 82–84 of the Education Act, 1921. Twenty-one of these authorities have submitted proposals for the provision of milk which have either been approved or are under consideration. In addition to the supply of milk under those sections, voluntary schemes for the provision of milk on payment are in operation in some of the schools in nearly all areas, but I am afraid that it is not at the moment possible to say definitely in which areas, if any, no milk is being supplied in the schools. I am having the matter examined and I am asking for returns from the schools showing the position at the end of March.

Mr. DAVIES: Will the hon. gentlema n say whether it is the policy of the Board to see that all children in all schools are supplied with milk, and if that be so, is it possible for the Board to take the initiative and see that that policy is implemented; is it also possible for the hon. gentleman to find out whether the voluntary organisations are adequate for supplying milk in schools?

Mr. RAMSBOTHAM: In Circular 1437 issued by the Board last September local authorities were specifically asked to encourage milk schemes. As regards voluntary organisations there has been an immense increase. A year ago about 900,000 children were getting milk under voluntary schemes and to-day the figure is well over 2,000,000, and I hope that it will approach 3,000,000.

Lieut.-Colonel ACLAND-TROYTE: Is it not a fact that many school-children are prevented from getting milk because of the medical officers of health and their fads about pasteurisation?

Mr. T. WILLIAMS: Will the hon. gentleman pay particular attention to rural areas where children are not securing milk largely because the milk is being transferred from their areas to industrial areas?

Mr. RAMSBOTHAM: I will look into that.

Treatment of Infectious Diseases in Brechin

Mr. LEONARD asked the Secretary of State for Scotland if he had considered the petition of the inhabitants of Brechin protesting at the lack of suitable accommodation for cases of scarlet fever and diphtheria; and what arrangements were being made by the Angus County Council to meet the needs and convenience of this part of the country.—Sir GODFREY COLLINS replied: Letters on the subject have been received by the Department of Health. The matter is under active consideration by the County Council, and the Department have already arranged to send a medical officer and an architect to consult with local officials as to the extent and location of any additional accommodation required.

New Criminal Lunatic Asylum for Scotland

Miss HORSBRUGH asked the Secretary of State for Scotland when legislation would be introduced to enable accommodation to be provided for criminal lunatics in substitution for the criminal lunatic department in Perth prison.—Sir G. COLLINS replied: A Bill to authorise the building of a new criminal lunatic asylum will be introduced in the House of Lords to-morrow, and it is hoped that it will become law this session. When the necessary powers are obtained the asylum will be built on land near Carstairs.

Miss HORSBRUGH: Will the State institution for defectives also be replaced?

Sir G. COLLINS: Yes, the institution for defectives will be erected on the same land.

Bovine Tuberculosis (The Spahlinger Treatment)

Commander OLIVER LOCKER-LAMPSON asked the Minister of Agriculture whether Dr. Spahlinger's bovine treatment for animal tuberculosis had been tested in England or Northern Ireland, and with what result.—Mr. ELLIOT replied: Apart from a test carried out on an estate in Norfolk in 1929–30, no test of Dr. Spahlinger's vaccine has, so far as I am aware, been carried out in England. An experiment has been in progress in Northern Ireland since December, 1931, under the auspices of the Ministry of Agriculture for Northern Ireland. An interim report on that test was published in the Veterinary Record of Dec. 17th, 1932. I understand that a final report may be expected shortly.

Captain CAZALET: Were not certain other tests made in England with extremely satisfactory results which were published in a report and are available for those who want to know them?

Mrs. TATE: Is it not a fact that the tests in Northern Ireland also have been entirely satisfactory?

Mr. ELLIOT: That is not quite so. An interim report has been published but the final report has not been published.

Commander LOCKER-LAMPSON: Can the right hon. gentleman say whether the English experiments have been satisfactory?

Mr. ELLIOT: No tests so far as I am aware have been carried out in England.

Medical Officers of Health Annual Reports

Dr. O'DONOVAN asked the Minister of Health if the annual reports of medical officers of health received by his department were subjected to departmental criticism.—Sir HILTON YOUNG replied: The annual reports of medical officers of health are examined in my department, but they are not ordinarily subjected to criticism.

Diphtheria in Leeds

Mr. GROVES asked the Minister of Health how many immunised children developed diphtheria at Leeds in 1933 and 1934; how many of these cases were shown to be Schick-negative, either primarily or after immunisation; and whether any and, if so, how many were shown to be Schick-negative at the time of notification or on admission to hospital as diphtheria patients.—Sir HILTON YOUNG replied: The following is the information furnished by the local authority on this subject:—

1. Immunised children who contracted diphtheria during the years 1933 and 1934	29
2. Immunised children who gave positive Schick test before being immunised	29
3. Immunised children who gave a negative Schick test after immunisation	20
4. Immunised children who gave a negative Schick test on admission to hospital	13

Note to 3.—The remaining nine of the group had not a final test as they were admitted to hospital with diphtheria before the test could be applied. *Note to* 4.—Of the remaining 16 cases, 9 had no final Schick test as explained in Note to 3, and 7 were not tested at the time of admission to hospital.

MONDAY, MARCH 18TH

Hospital Accommodation in Staffordshire

Mr. LOVAT-FRASER asked the Minister of Health if he was aware that the Staffordshire Public Assistance Committee had recently issued instructions that patients in the Aldridge urban district area should be accommodated at Hallam Hospital, West Bromwich, instead of at Manor Hospital, Walsall, as heretofore; whether he was responsible for this decision and, if so, on what grounds was this decision made; if he was aware that this decision caused inconvenience and hardships to the poor of the district; and if he had received any protests on the matter.—Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry of Health) replied: The answer to the first part of the question is in the affirmative and to the second part in the negative. As regards the last two parts, my right hon. friend has received a protest from the Urban District Council and is in communication on the matter with the County Council with whom the responsibility in the matter rests.

Deaths following Vaccination

Mr. GROVES asked the Minister of Health how many death certificates were received during 1934 in which death was attributed to vaccinia or vaccination, or in some way associated with vaccination; and what were the ages of the victims of vaccination to whom these certificates referred.—Sir HILTON YOUNG replied: The answer to the first part of the question is seven. The ages of the persons concerned were 3 months, 4 months, 8 months, 6 years, 7 years, 18 years, and 20 years respectively.

Alcoholic Liquor and Road Accidents

Mr. RHYS DAVIES asked the Minister of Transport the terms of the communication made by him to the British Medical Association inquiring into the connexion between the consumption of alcoholic liquor and road accidents; and if he would state the names of the members of the sub-committee making the inquiry and whether they would call for evidence in this connexion.—Mr. HORE-BELISHA replied: I asked the British Medical Association whether they could give me any information on the question of the connexion between the consumption of alcoholic liquor and road accidents. The Association have informed me that they have appointed a committee consisting of 15 members to examine the question. I hope that the hon. gentleman will agree that all matters in connexion with this inquiry may safely be left in their responsible discretion.

TUESDAY, MARCH 19TH.

Maternal Mortality and Morbidity

Mr. GUY asked the Secretary of State for Scotland what progress had been made by the scientific advisory committee of the Department of Health on maternal mortality and morbidity, and when their Report was likely to be published.—Sir G. COLLINS replied: Every effort is being made to expedite publication of the Report. The inquiries have involved the scrutiny of over 42,000 cases.

Flogging of a Prisoner

Mr. WEDGWOOD asked the Home Secretary, with regard to the case of flogging in April, 1934, where a wound on the chest caused by the flogging necessitated prolonged treatment, what was the age of the prisoner; what other sentence accompanied the sentence of flogging, and for what offence; were there any previous convictions against him; how long a time elapsed between the flogging and the healing of the wound; whether any investigation was made by the prison commissioners; and if so, what was its nature and was any medical opinion obtained on the case other than that of the prison medical officer.—Sir J. GILMOUR replied: The prisoner in question was convicted of attempt to suffocate, entering a dwelling-house with intent to commit a felony and with assault with intent to ravish, and was sentenced to three years' Borstal detention in addition to the award of corporal punishment. At the date of conviction his age was just over 18. He had no previous convictions. The suggestion that there was a wound requiring prolonged treatment is mistaken. As I explained in reply to a previous question, the injury was superficial only. It was of so trivial a character that the records do not show when it was completely healed, but the period was about a fortnight. The subsequent treatment to which I referred was for a local inflammation which developed later. There was no indication that the prisoner's condition called for any special investigation, but he was, in fact, seen by the Medical Commissioner when he visited the Borstal institution. The Medical Commissioner informs me that from the history of the case he is not sure whether the local inflammation may not have arisen independently, but in any case he was satisfied that the prisoner had received proper treatment.

Chinese Eggs

Mr. MARCUS SAMUEL asked the Minister of Health whether, in view of unfavourable reports on the inferior condition of Chinese eggs prior to or after packing in liquid form introduced into this country, he would instruct his inspectors to enter premises where such egg products were being used for human consumption and instruct them to make tests to ascertain the condition of the egg liquid, either by taste or by smell, with a view to condemning them if found unfit for human consumption.—Major G. DAVIES, Lord of the Treasury, replied: The inspection of food is a function of the officers of local authorities and not of my right hon. friend's department, and as at present advised he does not think it necessary to draw their special attention to this matter.

Medical Practitioners in Ceylon

Mr. THOMAS WILLIAMS asked the Secretary of State for the Colonies how many people resided in Colombo; and how many doctors were practising in the city.—Sir P. CUNLIFFE-LISTER replied: In 1933, the latest year for which figures are available, the estimated population of the municipality of Colombo was 294,420. According to the Medical Register for the same year the number of medical practitioners registered in Colombo was 182. I am not in a position to say what actual percentage of these doctors, or other practitioners registered outside Colombo, actually practise within the municipality.

Mr. THOMAS WILLIAMS asked the Secretary of State for the Colonies how many doctors were practising in Ceylon; how many of them confined their activities to the large cities; and what medical service, if any, was available for workers in the country areas.—Sir P. CUNLIFFE-LISTER replied: The latest figures available shows the number of medical practitioners registered in Ceylon as 811. There is no other town of comparable size to Colombo in the Island. In addition to private practitioners the authorised establishment of the Government medical service is 351 medical officers and medical officers of health, and 683 apothecaries and sanitary inspectors, but it would be difficult to say precisely what proportion of these officers devote their services to country areas. In 1933, outside Colombo, there were 89 Government and 84 estate hospitals, the number of hospital beds provided by the Government being approximately two per 1,000 of the population. In addition, 626 central and branch dispensaries and visiting stations were maintained by the Government and 727 dispensaries by estates.

Anæsthetics in Childbirth Cases

Sir WILLIAM RAY asked the Minister of Health if he was aware that prolonged experiments had been carried out in many voluntary maternity hospitals and in certain London County Council hospitals, and at the Wellhouse Hospital, Barnet (a Herts County Council hospital), with a view to finding some safe and satisfactory method of relieving the pain of childbirth; and whether, considering the successful results of these experiments, he would recommend all public assistance maternity hospitals throughout the country to make use of some form of anæsthesia for their patients and to undertake further research work of a like nature.—Sir HILTON YOUNG replied: I have noted with interest the experiments referred to in the first part of the question. As regards the second part, I am advised that medical opinion is not unanimous as to the safety and desirability of administering anæsthetics in all cases of childbirth, and I should not be justified in making a general recommendation as to the adoption of particular clinical and therapeutic methods, which must remain within the discretion of the medical officers responsible for the care of their patients. I have no doubt that the medical officers of hospitals provided by local authorities are, in common with the medical profession generally, fully alive to the importance of continued investigation of this subject, and the visits of my medical officers to these hospitals afford opportunities of discussing the arrangements for inducing anæsthesia in suitable cases.

MEDICAL NEWS

University of Cambridge

On March 15th the following degrees were conferred:—

M.Chir.—J. K. Monro.

M.B., B.Chir.—G. N. Bailey, R. H. Bailey, G. A. Emmerson, G. H. Jennings, and J. L. Lovibond.

B.Chir.—*C. R. McLaughlin, *Basil Rothery, *H. H. Bayley, K. L. Buxton, and Kenneth Lumsden.

* By proxy.

University of London

Applications are invited from graduates of the University of London for the Sir Henry Royce fellowship for research on either the nature, prevention, and cure of the common cold or of influenza. Particulars of the fellowship were given in THE LANCET (1934, II, 902) on its foundation, and further details will be found in our advertisement columns.

University of Aberdeen

Dr. John Blewett, who is at present on the staff of the Christie Hospital and Holt Radium Institute, Manchester, has been appointed to the lectureship in radiology in the University. He will also be in charge of the X-ray, electrotherapeutic, light, and massage department of the Aberdeen Infirmary.

University of Birmingham

Four introductory lectures on preventive medicine in industry will be given by Dr. Howard Collier, newly appointed reader in industrial hygiene and medicine, on Wednesdays, from May 1st. The subjects (provisionally) will be dust and fume diseases, metallic poisoning, industrial dermatitis, and industrial organic toxins, and the lectures will be given in the anatomy theatre of the University at 3.30 P.M. The William Withering lectures will this year be delivered at the medical faculty building at 4 P.M. each Thursday during May. Prof. E. Hindle, Sc.D., will give the first three, on the general properties of viruses and virus infections in general, and Dr. E. Weston Hurst will give the last two, on neurotropic virus infections. Prof. K. D. Wilkinson will deliver the Ingleby lectures on Thursdays, June 13th and 20th, and his subject will be acute rheumatism and its results.

Post-graduate demonstrations arranged by the University clinical board are to be held on Tuesdays and Fridays, from March 26th to July 9th. Particulars may be had from the clerk to the board, at the University, Edmund-street, Birmingham, 3.

Royal Sanitary Institute

On Tuesday, April 9th, at 5.15 P.M., Mr. Eardley Holland, obstetrical and gynæcological surgeon at the London Hospital, and Dr. R. Veitch Clark, medical officer of health for Manchester, will open a discussion on maternal mortality. The meeting will be held at the house of the institute, 90, Buckingham Palace-road, London, S.W.

Royal College of Surgeons of England

An ordinary meeting of the council was held on March 14th, with Mr. Wilfred Trotter, vice-president, in the chair. It was decided that an address of congratulation should be sent to the King and Queen on the completion of the 25th year of their reign.

It was reported that Sir Holburt Waring, the President, had opened the new building of the Royal Australasian College of Surgeons in Melbourne on March 4th. A special lecture will be given at the College on May 1st by Dr. William B. Coley, consulting surgeon to the Memorial Hospital, New York.

A diploma of fellowship was granted to William Henry Graham Jessop and a diploma of membership to Arthur Jacob Helfet.

Licences in dental surgery were granted to the following:

J. L. H. Baldwin, Raymond Baldwin, O. S. Bennett, Jack Blackshaw, Hugh Bradley-Watson, David Chalmers, R. S. Cook, F. D. Derrick, W. J. Drummond, H. P. Evans, D. P. Fox, J. J. Gaterell, B. M. A. Gilbert, R. E. Goodrich, J. L. Gottlieb, H. G. Hexter, L. H. Hilton, W. B. Hubbard, R. G. Hunt, W. S. Jackson, Lleufer Jonathan, E. H. Koonin, J. B. Morris, Jack Mort, C. W. Pimlott, R. F. P. Piper, F. A. Rogers, D. S. Stephenson, A. H. Tattersall, J. W. Turner, and R. V. Wiffen.

Diplomas in ophthalmic medicine and surgery were granted jointly with the Royal College of Physicians to the following:—

H. L. Anand, E. J. Baldwin, G. D. J. Ball, A. H. Briggs, R. U. Hingorani, V. V. H. Hoakai, Alice B. Laker, T. B. Law, L. A. Lewis, F. M. Lyons, Abraham Mellick, J. D. Saggar, L. R. Sarin, Peter Shannon, and Edward Wolstein.

University of Manchester

Dr. Adam Davidson Macdonald has been appointed Leech professor of pharmacology, mat eria medica, and therapeutics as from Sept. 29th next.

Dr. Macdonald was educated at the High School, Dundee, and the University of Edinburgh. After service in the Royal Naval Air Service and the Royal Air Force, during which he was mentioned in dispatches, he returned to Edinburgh and graduated M.A. in 1920 and M.B. in 1923. For some time he acted as assistant to Sir Edward Sharpey-Schafer, and in 1925 was awarded the Goodsir memorial research fellowship. After periods of research experience in the universities of Paris and of London, he was appointed in 1926 lecturer in experimental physiology in the University of Manchester and in 1928 became reader in materia medica and therapeutics, shortly after the retirement of Prof. R. B. Wild from the Leech chair. Dr. Macdonald has published papers based upon the standardisation of drugs, on local and spinal anæsthetics, and on the posterior pituitary hormones.

Aberdeen University Club

The half-yearly dinner of the London branch of this club will be held at the Café Royal, at 7 for 7.30 p.m., on Thursday, April 11th. Sir George Adam Smith, the principal of the University, will preside. The hon. secretary's address is 16, Tregunter-road, S.W.10.

THE centenary dinner of St. Mark's Hospital will be held at the Mansion House, London, the Lord Mayor presiding, on Thursday, April 25th. Communications should be made to the Secretary, St. Mark's Hospital, City-road, London, E.C. 1.

Scholarships for Sons of Medical Men

Two Sir Milsom Rees scholarships for sons of medical practitioners of £100 each to Port Regis preparatory school, Broadstairs, have been awarded to C. Wigram, son of Mr. N. G. Wigram, and to A. K. Hendry, son of Dr. J. A. Hendry.

Microchemical Club

At the annual general meeting of this club, in London on March 16th, the following officers were elected for 1935–36: hon. treasurer and librarian, Mr. L. H. N. Cooper (Marine Biological Laboratory, Plymouth); hon. secretary, Mr. S. J. Folley (National Institute for Research in Dairying, Shinfield, Reading).

German Radiological Congress

The twenty-sixth congress of the Deutsche Röntgengesellschaft Society will take place at the Langenbeck-Virchow-Haus (Luisenstr. 58, Berlin) from April 28th to 30th under the presidency of Prof. Willy Baensch (Leipzig). The first day will be devoted to diagnosis, the second to therapy, and the third to theory and technique. The scoiety may be addressed at Berlin, N.W. 87, Brückenallee 22.

Mackenzie Medal in Ophthalmology

The William Mackenzie medal for 1935 for original contributions to ophthalmology of outstanding merit has been awarded to Miss Ida Mann by the custodians, the Glasgow Eye Infirmary, on the advice of a committee representative of the University of Glasgow, the surgeons of the infirmary and of the Glasgow Ophthalmic Institution, and the Fellows of the Royal Faculty of Physicians and Surgeons, Glasgow. Miss Mann is to give an address at the Faculty Hall (242, St. Vincent-street, Glasgow) on June 7th, when the medal will be presented. Miss Mann will speak on congenital defects of the lens and their embryology.

Alfred Eichholz Memorial Clinic

A systematic course of physical treatment for weight reduction has been arranged at 204, Great Portland-street, London, in order to augment existing medical treatment by means of massage, Swedish remedial exercises, and baths (including the foam bath). A full range of electrical treatment is also available and the clinic is equipped with modern rest rooms for the convenience of patients. For those requiring treatment at home the clinic can arrange for the attendance of blind chartered masseurs and masseuses wherever required.

Physical Education in Belgium

The Société Médicale Belge d'Education Physique et de Sports has organised an international conference to be held from June 30th to July 3rd in Brussels, under the presidency of Prof. J. Demoor, who will deliver an opening address on the rôle of the doctor in physical education. Other subjects that will be discussed are early diagnosis of cardiac disorders; the value of motor tests in physical education; and the cult of the bicycle. The secretary of the conference is Dr. E. Rebuffat, 50, rue de l'Abbaye, Brussels.

Fellowship of Medicine and Post-Graduate Medical Association

From April 1st to 13th there will be an afternoon course in infants' diseases at the Infants Hospital, and a course in ophthalmology at the Royal Eye Hospital. From April 8th to 13th a course in proctology will be given at St. Mark's Hospital. Other forthcoming courses include psychological medicine at the Maudsley Hospital (April 23rd to May 31st), dermatology at St. John's Hospital (April 29th to June 1st), and medicine, surgery, and gynæcology at the Royal Waterloo Hospital (April 29th to May 11th). A special demonstration on the Fundus Oculi will be given by Mr. R. Lindsay Rea at the West End Hospital for Nervous Diseases at 8.30 P.M. on Tuesday, April 2nd. A panel of teachers provides daily individual clinics in various branches of medicine and surgery. Courses of instruction arranged by the Fellowship are open only to members and associates. Detailed syllabuses of all courses can be had from the secretary of the Fellowship, 1, Wimpole-street, W.

Notification of Chicken-pox in the City of London

On May 18th the Order under Section 55 of the Public Health (London) Act, 1891, making chicken-pox notifiable in the City of London was extended for a further period of twelve months. There are at present no cases of variola minor in that or any other part of the London area, but the measure has been taken in order to avoid the possibility of mistaking chicken-pox for variola major should that make its appearance.

Bristol General Hospital

Miss Hilda Wills, president of this hospital, has offered £6000 towards the £12,000 scheme for a new X ray, massage, and electrical department.

Stockton Hospital

The number of patients at Stockton Hospital increases every year, and a considerable improvement in the financial position of the institution is reported, last year's income showing an increase of almost £3000.

Florence Nightingale Hospital

The Princess Royal visited the Florence Nightingale Hospital for Gentlewomen in Lisson-grove, to commemorate the 25th anniversary of its rebuilding after removal from Harley-street. She saw the cubicled wards and private rooms, and inspected the sterilising-room.

Sheffield Voluntary Hospitals

Not only was income sufficient last year to meet the expenditure of the Sheffield voluntary hospitals, but it was possible to overtake many arrears of maintenance such as painting, cleaning, and decorating. A sum of £1600 was collected from the unemployed during 1934.

Dorset County Hospital

It is proposed to erect a nurses' hostel on the east side of this hospital, providing accommodation for 40 nurses—a bedroom for each, 10 bathrooms, a dining-room, and a drawing-room. Central heating will be installed in every room.

Royal Berkshire Hospital

Instructions for plans have been given for the reorganisation of the out-patient department, and the provision of adequate accommodation for the treatment of ear, nose, and throat cases at this hospital at Reading. More room is also required for maternity and gynæcological cases, and for the pathological department.

Royal Sussex County Hospital

At the annual meeting of the governors of this hospital the following extract from the report of the hon. medical and surgical staff was read: "An increasing number of acute cases is being sent away. Numerous cases which have been sent to the out-patients' department and have had their names entered on the waiting list for admission are found to have become acute during the waiting period, and, therefore, have been compelled to seek treatment elsewhere. In other cases great hardship and loss of earning capacity are caused by this waiting. Certain conditions found to be operable when seen in the out-patients' department are found to be inoperable on admission." It was therefore decided to build an extension to accommodate 100 beds, and a Jubilee appeal is being launched for £60,000 capital expenditure, £8000 per annum for maintenance. Dr. Donald Hall, chairman of the hon. medical staff, opened the fund with a donation of £500, given in celebration of his silver wedding.

The annual report showed that the hospital had been largely dependent on legacies for meeting the year's expenditure, and that there was a deficit of £900 in respect of motor accident cases. Out of a total of 250 beds, the average daily number occupied was 231·82, and there were 18,087 new out-patients and 8974 casualty patients.

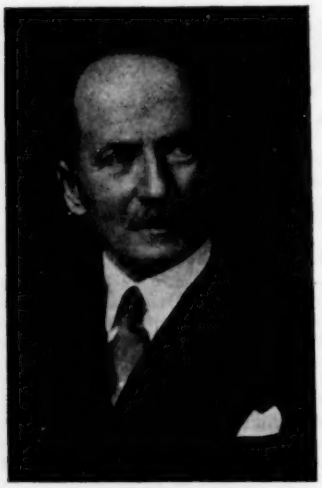
OBITUARY

JOHN J. R. MACLEOD, F.R.S., D.Sc., M.D. Aberd., F.R.C.P. Lond.

REGIUS PROFESSOR OF PHYSIOLOGY, ABERDEEN

THE death occurred on Saturday last, March 16th, of Prof. Macleod, the discoverer with Sir Frederick Banting, and in association with other workers, of insulin as a specific for diabetes. He was at the time of his death, which occurred at the age of 58, regius professor of physiology at Aberdeen.

John James Rickard Macleod was born at Cluny, near Dunkeld, Scotland, in 1876, the son of the Rev. Robert Macleod of Aberdeen. He was educated at the Aberdeen grammar school and Aberdeen University, where he gained prizes and honours, graduating with distinction as M.B., Ch.B. Aberd. in 1898. He was awarded the Anderson travelling fellowship, and spent a year in the Physiological Institute at Leipzig, when he was appointed demonstrator of physiology at the London Hospital medical school. In 1902 he became lecturer in biochemistry at the school, and was also selected as Mackinnon research scholar of the Royal Society. While at the London he published an account of experiments on intracranial circulation and on caisson disease, carried out in conjunction with Sir Leonard Hill, and he retained his interest in the problems of respiration throughout his life, publishing many papers on the control of respiration between the years 1902 and 1922. He was thus marked out from the beginning for distinction in his branch of science. He wrote a useful work entitled "Practical Physiology" in 1903, the year when he was appointed professor of physiology at the Western Reserve University, Cleveland.



[Photograph by Elliott and Fry

PROF. MACLEOD

For the next 25 years his researches were carried out first in America and later in Canada at the University of Toronto, and their outcome was recorded in various publications and communications to scientific and medical periodicals. In 1913, nearly ten years before the discovery of insulin was made, Macleod wrote a book on diabetes and its pathological physiology, an expansion of lectures which he had delivered during the summer of 1912 at the University of London. The problem of diabetes in this book was not studied directly from the practitioner's aspect, and it is interesting in view of the sequence of events that no attempt was made by Macleod to consider the whole field of diabetes, attention being given only to what might have a more or less direct bearing on the nature of abnormal conditions in the animal body. The amount of individual work, of study of the researches of others in the laboratory, and of consultation of literature, displayed in this book showed the way in which Macleod, while keeping in touch with others working in the same field, was preparing the ground. While the variety of his interests was illustrated by papers on the chemistry of the carbamates and purine metabolism (1905–1906), on surgical shock (1918–1920), on the physiology of the intracranial circulation (1918), and on ventilation (1920–1921), his published studies in carbohydrate metabolism began with a series of papers on experimental glycosuria published from 1908 onwards.

In 1918 Macleod was appointed professor of physiology in the University of Toronto and co-dean of the faculty of medicine. Shortly afterwards he published his work entitled "Physiology and Biochemistry in Modern Medicine," being assisted in the production of a volume of nearly 1000 pages by Dr. Roy Pearce and others. The book dealt with chemistry and physics, omitting such portions of the general subject of physiology as directly appertained to structure, and in it there were brought out the various aspects of physiology up to date, connecting these aspects with clinical observations, so that both student and clinician found the work extremely helpful. By 1921 he had made a thorough examination of the control of the blood-sugar level in the normal and depancreatised animal, and of the rôle played by the liver, muscles, and pancreas in the metabolism of sugar. It was natural, therefore, when Dr. F. G. Banting came to him with his ideas on the preparation of the active principle of the pancreas, that Macleod, with his kindly willingness to listen to the theories of younger men, should place the facilities of his laboratory at Banting's disposal. The subsequent researches, which gave insulin to the world, are well known. Macleod and Banting jointly shared the Nobel prize for medicine in 1923, Macleod dividing his share with J. B. Collip, while Banting divided his with C. H. Best, for Best and Collip had played an important part in the early research on insulin; as Macleod said, "it was only team-work that made insulin possible." Macleod received the F.R.S. and a long string of academic distinctions, among others an honorary LL.D. from Aberdeen and the D.Sc. from Toronto.

In 1928 Macleod returned to his Alma Mater, Aberdeen, as regius professor of physiology, and in the course of his professorial duties continued his intensive study of diabetes as a physiological problem. He continued to investigate the rôle of insulin in the metabolism of carbohydrate, but lately had taken up the problem of the nervous control of hepatic glycogenesis, and had carried out important researches on the question of the existence of a "diabetic centre," during the years preceding his last illness.

Macleod wrote much on physiology in general and carbohydrate metabolism in particular, in addition to the literary output already mentioned, and his "Physiology and Biochemistry in Modern Medicine" reached its seventh edition last year. As a teacher he was beloved by his students for his charming manner and lucid expositions of the most intricate details of physiological mechanism. As a director of research he will be long remembered for his readiness to consider the ideas of his most junior assistant, when with kindly tact he would point out what he considered to be the arguments against the suggested experiments, invariably finishing with the admonition, "try the experiment yourself; it may be worth while." He will always be thought of by his many friends, associates, and

pupils as one of the brightest and cheeriest of men. His optimism against all odds was a prominent feature of his life, and was conspicuous to all around him in his long months of suffering, which he bore with patience and fortitude.

WILLIAM JOHN ADIE, M.D. Edin., F.R.C.P. Lond.

PHYSICIAN, CHARING CROSS HOSPITAL; ASSISTANT PHYSICIAN, NATIONAL HOSPITAL, QUEEN-SQUARE, W.C.

THE death occurred on Sunday last, March 17th, at his house at Golders Green, of Dr. William John Adie, physician to Charing Cross Hospital, and also physician to out-patients at the National Hospital, Queen-square. He had been ill for three years and died at the premature age of 49 of coronary thrombosis.

Dr. Adie was an Australian by birth, the eldest son of Mr. David Adie, of Geelong, and was educated at the Flinders School in that seaport. He received his medical training at the University of Edinburgh, where he was a prominent oar as well as McCosh scholar, and graduated as M.B., B.Ch. in 1911; on proceeding to the M.D. degree he obtained distinction in the final examination with a gold medal for the thesis. He now did post-graduate medical work in Munich and Berlin, and on return practised for a time in Edinburgh. Coming to London he served as house physician at the National Hospital, Queen-square, and was soon elected in succession to the staffs of the Royal Northern Hospital and the Royal London Ophthalmic Hospital, acting also as neurologist to the Mount Vernon Hospital, Northwood. He took the diploma of M.R.C.P. Lond. in 1919, and was elected F.R.C.P. in 1925, having by this time been appointed physician to Charing Cross Hospital and physician to out-patients at the National Hospital. In the meantime came the war, and at its outbreak he was battalion medical officer to the 1st Northamptonshire regiment, which was cut to pieces in the retreat from Mons. Subsequently he was posted to the Leicestershire regiment, but was now withdrawn from the line to act as medical officer in charge of the 7th General Hospital of the British Expeditionary Force, and was also a consultant to the 2nd Army Centre for gunshot wounds in the head. At St. Omer, where he was in charge of a hospital for head wounds, he collected valuable neurological material which unfortunately he never found time to assemble and publish. He saw service abroad during the whole campaign and was more than once mentioned in dispatches.

He was not a frequent writer considering the range of his practical experiences, but in collaboration with the late James Collier he wrote the section on diseases of the nervous system in Price's Text-book of Practical Medicine, and made communications to *Brain* and other scientific journals, notably on dystrophia myotonica, and narcolepsy ("Maladie d'Adie"), and pyknolepsy. In recent years, since his election to the staff of Moorfields, he took particular interest in the ophthalmological side of neurology, and wrote on the pseudo-Argyll Robertson pupil, on pituitary tumours, and on the ophthalmic aspects of disseminated sclerosis. Adie was much in demand as an opener of discussions at medical societies, for he possessed the art of summarising complex problems with clarity and elegance. He was, moreover, an expert linguist, reading with ease almost every European language. His clinical acumen was his outstanding quality, and British neurology has suffered a real loss in his untimely death.

A colleague writes: "It is surely seldom that fate is quite so cruel as it was to Adie. It seemed to heap favours upon him and then when he was in the full flight of success it struck him down, and his last few years were lived under the threat of death. He had a personality that was not merely attractive but immediately lovable—modest, simple, and approachable—and to this were added all the other qualities of character and training that go to make a great physician. He had sympathy, a wide knowledge not merely of neurology but of general medicine, and a joy in acquiring new knowledge; he had also a remarkable insight and quickness in diagnosis. In treatment he always used the simplest available measures. Expensive and untried drugs made no appeal to him; he knew when treatment was futile and he would not be persuaded or coerced into officious action. His place on the staff of the hospitals to which he was attached will be doubtless taken by others no less distinguished, but he had a niche in the affections of his colleagues and friends that will not readily be filled."

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, March 25th.

Odontology. 8 P.M. Prof. A. Fleming: Some Factors in the Use of Antiseptics. Dr. L. P. Garrod will open discussion of paper. Members of the Section of Therapeutics are invited.

TUESDAY.

Medicine. 5 P.M. Discussion: The Rôle of Cholesterol in Health and Disease. Opener: Dr. Hugh Gainsborough. Other Speakers: Dr. R. D. Lawrence and Dr. C. E. Newman.

WEDNESDAY.

Comparative Medicine. 5 P.M. C. L. Oakley: Lymphomatosis of the Fowl (fowl paralysis). E. L. Taylor: Some Fallacies in the Diagnosis of Helminthic Disease. T. J. Bosworth and R. E. Glover: Differential Character of *C. welchii* Type D.

THURSDAY.

Urology. 8.30 P.M. Discussion: The Radiological Diagnosis of Renal Lesions, excluding Stone. Openers: Mr. Bernard Ward and Dr. Mather Cordiner. Members of the Section of Radiology are invited.

MEDICO-LEGAL SOCIETY, 11, Chandos-street, Cavendish square, W.

THURSDAY, March 28th.—8.30 P.M., Mr. Albert Crew: The Reformation of the Old Bailey.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.

MONDAY, March 25th.—8.30 P.M., Dr. H. Graham Hodgson: The Future of Diagnostic Radiology.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY 49, Leicester-square, W.C.

WEDNESDAY, March 27th.—4.30 P.M., Clinical Cases.

BRITISH PSYCHOLOGICAL SOCIETY.

Medical Section.

WEDNESDAY, March 27th.—8.30 P.M. (at 11, Chandos-street, W.), Mr. J. D. Unwin, Ph.D.: Sex Regulation and Culture.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.

TUESDAY, March 26th, and THURSDAY.—5 P.M., Prof. C. R. Harington, F.R.S.: Biochemical Basis of Thyroid Function. (Oliver Sharpey lectures.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

MONDAY, March 25th.—5 P.M., Mr. R. W. Raven: Abnormalities of Surgical Importance Resulting from the Persistence of Rudimentary Embryological Structures.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

SATURDAY, March 30th and 31st.—SOUTHEND GENERAL HOSPITAL. Week-end course in general medicine and surgery.—Courses, clinics, arranged by the Fellowship are open only to members and associates.

WEST LONDON POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, March 25th.—10 A.M., medical wards and skin clinic. 2 P.M., operations, surgical and gynæcological

wards, medical, surgical, eye, and genito-urinary clinics. 4.15 P.M., Mr. Green-Armytage: Unexpected Complications of Normal Labour.
TUESDAY.—10 A.M., medical wards. 11 A.M., surgical wards. 2 P.M., operations, medical, surgical, and throat clinics.
WEDNESDAY.—10 A.M., children's wards and clinic. 11 A.M., medical wards. 2 P.M., gynæcological operations, medical, surgical, and eye clinics. 4.15 P.M., Dr. Konstam: Megalocytic Anæmia.
THURSDAY.—10 A.M., neurological and gynæcological clinics. 11 A.M., fracture clinic. 2 P.M., eye and genito-urinary clinics.
FRIDAY.—10 A.M., skin clinic. Noon, lecture on treatment. 2 P.M., medical, surgical, and throat clinics. 4.15 P.M., Mr. Vlasto: Dysphagia.
SATURDAY.—10 A.M., medical wards, children's and surgical clinics.
The lectures at 4.15 P.M. are open to all medical practitioners without fee.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
MONDAY, March 25th.—Noon, Dr. W. W. Payne: Diabetes. 3—Complications.
WEDNESDAY.—2 P.M., Mr. E. I. Lloyd: Scoliosis.
THURSDAY.—Noon, Dr. A. Signy: Tuberculin Tests and B.C.G. Vaccine.
FRIDAY.—Noon, Dr. W. G. Wyllie: Albuminuria in Childhood.
Out-patient clinics daily at 10 A.M. and ward visits (except on Wednesday) at 2 P.M.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, March 25th.—3.30 P.M., Dr. Hinds Howell: Acute Encephalitis and Encephalo-myelitis.
TUESDAY.—3.30 P.M., Mr. Julian Taylor: Injuries of the Spinal Cord.
WEDNESDAY.—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.
THURSDAY.—3.30 P.M., Dr. George Riddoch: Cerebral Abscess and Meningitis.
FRIDAY.—3.30 P.M., Dr. Hugh Davies: Radiology in Disease of the Nervous System.

CANCER HOSPITAL (FREE), Fulham-road, S.W.
THURSDAY, March 28th.—4 P.M., Mr. W. Allin Mill: Early Diagnosis of Malignant Disease in the Nose and Throat.

HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.
THURSDAY, March 28th.—3 P.M., Dr. Anthony Feiling: Demonstrations.

CHADWICK LECTURE.
WEDNESDAY, March 27th.—5 P.M. (lecture theatre, St. Bartholomew's Hospital, E.C.), Mr. Henry Corsi: Syphilis Through Four Centuries. (Malcolm Morris memorial lecture).

HAMPSTEAD GENERAL AND NORTH-WEST HOSPITAL, N.W.
WEDNESDAY, March 27th.—4 P.M., Dr. A. J. Scott Pinchin: A General View of Coronary Sclerosis and Thrombosis.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, March 29th.—4 P.M., Mr. A. Lowndes Yates: Hoarseness.

BRITISH RED CROSS SOCIETY CLINIC FOR RHEUMATISM, Peto-place, N.W.
THURSDAY, March 28th.—8.30 P.M., Dr. F. D. Howitt: The Symptom Complex commonly known as Chronic Arthritis.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, March 28th.—9 P.M., Mr. Myles Bickerton: Common Injuries to the Eye and Their Treatment.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, S.W.
WEDNESDAY, March 27th.—4 P.M., Mr. Laurence O'Shaughnessy: Surgical Treatment of Angina Pectoris.

UNIVERSITY OF BIRMINGHAM.
TUESDAY, March 26th.—3.30 P.M. (General Hospital), Prof. Wynn: The Treatment of Septicæmias.
FRIDAY.—3.30 P.M. (Queen's Hospital), Prof. W. Gemmill: Demonstration of Surgical Cases.

GENERAL INFIRMARY, Leeds.
TUESDAY, March 26th.—3.30 P.M., Surgical Cases. 4.30 P.M., Operation; Thoracoplasty for Pulmonary Phthisis.

PUBLIC DISPENSARY AND HOSPITAL, Leeds.
WEDNESDAY, March 27th.—4 P.M., Mr. L. N. Pyrah: Infections of the Urinary Tract.

GENERAL HOSPITAL, Newcastle-on-Tyne.
SUNDAY, March 24th.—10.30 A.M., Dr. G. F. Duggan: Surgical Cases.

ANCOATS HOSPITAL, Manchester.
THURSDAY, March 28th.—4.15 P.M., Dr. A. Renshaw: Failure of Conception and Pregnancy.

ROYAL INFIRMARY, Manchester.
TUESDAY, March 26th.—4.15 P.M., Prof. S. L. Baker: The Pathology of Arterial Disease.
FRIDAY.—4.15 P.M., Dr. F. E. Tylecote: Demonstration of Medical Cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, March 27th.—4.15 P.M. (Victoria Infirmary), Mr. N. G. W. Davidson: Surgical Cases.

Appointments

BLEWETT, JOHN, M.D. Melb., D.M.R., has been appointed Radiologist to the Royal Infirmary and Lecturer in Radiology to the University, Aberdeen.

EXNER, G. G., M.R.C.S. Eng., L.D.S., D.M.D., Hon. Dental Surgeon to the Miller General Hospital, Greenwich.

GILLAN, R. U., M.B. Aberd., D.O.M.S., Hon. Ophthalmic Surgeon to the West Bromwich and District General Hospital.

HUCKNALL, R. H., M.R.C.S. Eng., Resident Surgical Officer to the Birmingham and Midland Eye Hospital.

MACKINNON, N. H. A., M.B. N.Z., Hon. Assistant Anæsthetist to the Hove General Hospital.

NIXON, W. C. W., M.D. Lond., F.R.C.S. Eng., M.C.O.G., obstetric surgeon to out-patients at Queen Charlotte's Maternity Hospital, London.

PINEY, A., M.D. Birm., M.R.C.P. Lond., Hon. Visiting Physician to the St. Pancras Dispensary.

ROUSE, J. E. C., M.B. Lond., Hon. Anæsthetist to Hove General Hospital.

RUTLEDGE, W. E., L.R.C.P. Irel., D.O.M.S., Hon. Assistant Ophthalmic Surgeon to the Norwich and Norfolk Hospital.

Charing Cross Hospital.—The following appointments are announced:
RANSOME, GORDON, M.R.C.P. Lond., Medical Registrar;
HUDSON, E. H., M.B., M.R.C.P. Lond., Part-time Medical Registrar; and
PARTRIDGE, G. T., M.B. Camb., F.R.C.S. Eng., Surgical Registrar.

Certifying Surgeons under the Factory and Workshop Acts: Dr. A. W. VAISEY (Lichfield, Staffordshire); Dr. J. WILKINSON (Masham, Yorkshire).

Births, Marriages, and Deaths

BIRTHS

ALCOCK.—On March 10th, at Reading, the wife of Dr. S. C. Alcock, of a son.

BARBER.—On March 15th, at Rood End, Great Dunmow, Essex, the wife of Geoffrey Barber, M.B. Camb., of a daughter.

DANBY.—On March 7th, at Edgbaston, the wife of Alfred Danby, F.R.C.S. Edin., of a daughter.

KRUSIN.—On March 15th, at Marlborough Mansions, Hampstead, N.W., the wife of Frank S. Krusin, B.D.S. Lond., M.R.C.S. Eng., of a son.

MONTEITH.—On March 17th, to Kathleen M. (née Bowman Manifold), M.D., wife of W. B. R. Monteith, F.R.C.S. Edin., Brook Lodge, Bourne—a daughter.

PETTY.—On March 9th, at Cardiff, the wife of Dr. Gerald Fitzmaurice Petty, of a son.

MARRIAGES

MABERLY—ENGLAND.—On March 16th, quietly in London, Alan Maberly, M.B. Camb., of Wimpole-street, to Deirdre, elder daughter of Mr. and Mrs. Frank England, of Wimbledon.

DEATHS

ADIE.—On March 17th, at Chester-terrace, N.W., William John Adie, M.D. Edin., F.R.C.P. Lond.

CLARKSON.—On March 14th, at Derek-avenue, Hove, Sussex, Lieut.-Colonel Frank Cecil Clarkson, M.R.C.S. Eng., I.M.S., retired, aged 73.

FORSYTH.—On March 12th, at a nursing home in London, William Forsyth, F.R.C.S. Edin., formerly Health Officer, Port of Calcutta, India, in his 85th year.

FULLER.—On March 15th, Laurence Otway Fuller, M.R.C.S. Eng., Medical Superintendent, Three Counties Hospital, Bedfordshire.

GREEN.—On March 16th, Lieut.-Colonel Douglas Richard Green, M.D. Lond., I.M.S., retired.

HENDERSON.—On March 17th, at St. Keverne, Christchurch-road, Cheltenham, Lieut.-Colonel Selby Herriot Henderson, M.B. Edin., late I.M.S.

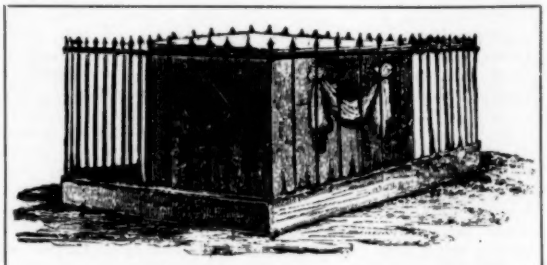
N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

GLASGOW ROYAL HOSPITAL FOR SICK CHILDREN.—The annual report of this hospital states that 6286 patients were treated in the hospital wards, and 1087 in the country branch during the past year. At the out-patients' departments 93,320 attendances were recorded. The special orthopædic fund, which was opened in 1932 to commemorate the hospital's fiftieth year, has reached a sum of £49,600. The directors are anxious to encourage the research work which is being carried out in connexion with the hospital.

NOTES, COMMENTS, AND ABSTRACTS

THE BODYSNATCHER

AN interesting document, a relic of body-snatching days, recently came into the hands of the Manchester Medical Society. The document, of which Dr. W. Brockbank sends an account, is a small leaflet 8 × 6¼ inches, printed on both sides and folded. One side is here reproduced :—



The REV. J. SCHOLEFIELD solicits the attention of such as have to perform the mournful tribute of respect to their deceased, to his

SAFETY TOMBS,

of which the adjoining sketch will give an idea, and which are unequalled by any in the town, or indeed in the kingdom. Their security has now been proved, and they continue to increase in the estimation of the public.

A large bell is fixed and connected with a spring; so that if any one approach within a certain distance, it will ring for a length of time, and thus give an alarm to the neighbourhood and notice of DANGER to any person who may have the TEMERITY to ATTEMPT an ENTRANCE after the VAULT is SECURED. Corpses are frequently put into the vault for a certain time for security, and afterwards removed into their own graves. The Keys are placed in the possession of the Proprietor every night.

DUES FOR THE SAFETY TOMB.

Still born Child	£0	1	6
A Child under one year old	0	5	0
A Child under five years	0	6	0
Above five years and not requiring a Bier	0	7	0
Large Corpse	0	8	0

Dr. Brockbank writes : "The Rev. James Scholefield was the first minister of the Round Chapel in Every-street, Manchester. This was built by the Bible Christians, a sect who abstained from animal food and fermented liquors. The building was opened in 1824, at which time Every-street was little more than a country lane, whilst behind the few houses erected on the southern side of the street open fields stretched down to the river Medlock. Now the surrounding area is slum property. It was a rule of the Bible Christians that their ministers should receive no stipend, and Scholefield practised medicine for a living. He was unqualified but had once been a medical student, and during the cholera epidemic of 1832 he introduced a cure which sold far and wide, and is still manufactured and sold as Dr. Scholefield's Cholera Mixture. He was a good business man and his safety tombs appear to have been popular, for a subsequent edition of the leaflet says : 'The Rev. J. Scholefield acknowledges with gratitude the patronage he has received towards his safety tombs. They are more secure than any in the Town or Neighbourhood and which security is duly appreciated by the Public.' Despite the popularity of the tombs their dues remained unaltered, and the following note is added : 'N.B.—J. S.' is about enclosing another Plot of land and enlarging his Burial Ground.' Scholefield died in 1855."

The Rev. J. Scholefield's circular was dated 1827, and the popularity of his tombs is comprehensible, for at that time bodysnatching was in full blast. It was during 1827 and 1828 that Burke and Hare committed their crimes, and in 1828 a Parliamentary Committee was appointed "to inquire into the study of anatomy as practised in the United Kingdom and into the best method of obtaining bodies for the purpose," for the resurrection men were clearly working to meet the need for subjects in the medical schools. Astley Cooper, the first witness called, after pointing out the necessity of practical anatomy for the proper education of a surgeon, said that the teachers of anatomy were completely "at the feet of the resurrection men." Henry Warburton at once introduced a Bill giving effect to the findings of the committee, a clause in which was "that men and women, males and females, who died in workhouses or who had the misfortune to die in hospitals without being claimed within a certain time of death should be sold for dissection." The Bill received steady support from Thomas Wakley, the founder of THE LANCET, and passed the House of Commons, but in the House of Lords was withdrawn at the instance of the Archbishop of Canterbury, there being no provision for the Christian burial of remains after dissection. Then a shocking murder in Bethnal Green of an Italian boy, whose body was offered as a subject for dissection at the medical school of King's College Hospital, brought the subject on the tapis again, and in 1832 the Anatomy Act was passed. We can understand the vogue for a tomb whose construction would defeat the enterprise of the Jerry Crunchers, but the circular quoted does not give all the information necessary to make the invention clear. It is not shown where the bell and spring are or how the spring is released when interference with the tomb takes place.

RARITY OF TUBERCULOSIS IN THE JEWS

DURING the past forty years there has been much discussion of the reasons why tuberculosis is comparatively rare among Jews; but as the material under review has hitherto been very limited, the conclusions drawn have often been repetitive. E. Arnould, however, has lately produced much new information bearing on the problem (Rev. de Phtisiol., July–August, 1934, p. 466), and considers the various possible solutions after an exhaustive survey of the facts. These are striking enough. In towns where there is a large Jewish element in the population the tuberculosis mortality among the Jews is said on the average to be only half that of the Gentiles. But as one passes from this fact to the explanations of it, the ground becomes as shifting as it was originally firm. Arnould cannot accept Calmette's view according to which the Jew, thanks to his town-dwelling propensities, contracts in early childhood a slight and immunising infection. An alternative suggestion is that the laws of hygiene laid down by the Talmud encourage a comparatively healthy mode of life; but Arnould is sceptical about the power of such laws to counterbalance the deplorable conditions under which great masses of the Jewish population live. Another notion is that the Jews show a preference for occupations which do not involve them in the overwork which is so often the determining factor in the outbreak of tuberculosis. On the other hand, as artisans and the occupants of small shops they follow trades which are notoriously unhealthy as far as tuberculosis is concerned. There is also the idea that the Jews comparative freedom from alcoholism is the secret of his immunity to tuberculosis. But once again Arnould finds himself more than sceptical; and by a process of elimination he comes to the conclusion that heredity is the most important factor. Since the dispersion of the Jews in the second century A.D.

they have clung as a class to the towns in which they have had to struggle against shocking conditions of hygiene. A process of natural selection has been going on for centuries, and the less resistant elements, as far as tuberculosis is concerned, have been gradually eliminated, while the more robust survivors have passed on their characteristics to their progeny. This view is shared with Arnould by Reibmayr, Fishberg, and other authorities on the subject.

MEDICAL HINTS

SINCE the authors of "1066 and All That" began to publish their misleading comments on human affairs other thinkers have arisen who hold that truth can be presented just as idiotically as fiction, and is assimilated better like that. Consequently we have enjoyed a course of light-hearted instruction, in the vein of "Shakespeare and That Crush," to which "Say 99" is a recent contribution.[1] Should the solemnities of medicine be made the subject of idle jest? Undoubtedly they should. And the laughing leech, whoever he may be, manages to squeeze a lot of useful information in among his rather scholarly jokes. He is not offensively highbrow, nor does he scorn the simple pun. His advice to the fat girl is sound: "Be content with an easy decline in the girth rate." He has a pleasant narrative method of beginning some of his brief essays: "Stanley Oliver Laurel Hardy, aged ten, is the representative of 'Safety Last' in our home" Others start on a more sombre note: "Summer makes animals aggressive." These titles are alluring; the reader stops to look at just one more before going on with his life's work—for example: "Sportsmen needn't be Spartans"; "Keep the Old Folks at Home"; "Heads up for the 8·52."

It is a little difficult, sometimes, to know for whom the book is designed—sometimes the author speaks as if to children and sometimes offers a prescription for adrenaline injections. On the whole, however, the layman has it, or should have it, and if it has not already been given to him for Christmas he should receive it for his birthday.

ARTIFICIAL FINGERPRINTS

SOME years ago the plot of a clever detective story, by Mr. Austin Freeman, "The Red Thumb-mark," turned upon the planting of an innocent person's fingerprint at the scene of the crime. An article in the *Journal of Criminal Law and Criminology* published in Chicago at the end of last year, summarised in the pages of our legal contemporary the *Justice of the Peace* several weeks ago, shows that fact can keep pace with fiction. Dr. Harold Cummins, of the Tulane University of Medicine, explains therein his experiments in the artificial reproduction and transference of fingerprints. In future the police expert may say with all his old confidence that the fingerprint found upon the window-pane is the fingerprint of the man in the dock who is charged with burglary; but, under the cross-examination of a desperate advocate, he may have to admit that there is just a possible chance that somebody else left the prisoner's fingerprint there. Dr. Cummins took an original genuine fingerprint, had it engraved by a commercial engraver, made a three-dimensional negative in dental base plate wax, took a cast from the negative in a film of gelatin, and stuck the gelatin on a dummy finger. From this artificial finger he obtained fingerprints in the usual way; they were rolled ink impressions clear and large. He placed on a card two of his original genuine fingerprints and two from his dummy finger. These were submitted to experts, who were told that the specimens included genuine and artificial impressions, and were asked to say which was which. Out of 32 diagnoses only 20 were correct. More mistakes, it seems, were made in calling genuine prints counterfeit than in calling counterfeit prints genuine. The editor of the Chicago journal afterwards tried the same experiment on other experts, one of whom was an official in charge of a fingerprint bureau. The percentage of error was about the same. It is pointed out that the artificial print may be distinguishable if it cannot reproduce the greasy appearance due to the perspiring surface of the living skin. But Dr. Cummins does not pretend that his first essays in fingerprint transference have been carried to the highest possible point of verisimilitude.

The results perhaps will make no sensational difference to those whose duty it is to detect crime. Identification by fingerprints, like identification by handwriting, is allowed in our courts of law and indeed may be the only evidence of identity, but juries hesitate to rely upon it if it is unsupported. Murderers are often too precipitate to employ the scientific processes which Dr. Cummins has described. If they use so much premeditation in order to cover up their tracks, they nevertheless offer other clues which are fatal. The burglar may be too busy for these refinements of evasion. There is honour among thieves and he may have no motive to incriminate other persons, unless he is a practical joker who carries with him the fingerprints of the chief of police or the Home Secretary. The planting of artificial fingermarks is a waste of time unless they belong to some member of the criminal classes whose records the police possess. It would be otherwise if there were a complete register of the fingerprints of the whole population, good and bad alike. Such a register is often desiderated. It would assist the identification of bodies found in trunks at railway stations or dragged from the Thames during periods of depression. Meanwhile, the best opening for Dr. Cummins's method lies in detective fiction and melodrama.

AN ADOPTION SOCIETY

A LETTER from the National Children Adoption Association, 71, Knightsbridge, London, S.W. 1, has the object of bringing the work of this association to the notice of members of the medical profession in the United Kingdom who, it is felt, must from time to time meet with cases in which the association could be of service to their patients. The association has, for instance, recently had two cases in each of which, a child having died at birth, the family doctor recommended that the mother should be provided with another immediately; and in both cases the association was able to find a suitable child. Experience shows that cases are frequent in which it is not possible for a mother to keep her child, either through inability to maintain it, or for other reasons. The association is prepared to receive applications from would-be adopters requiring children, or from parents or guardians of children who need adoption. All applications are examined by the case committee and are treated with the utmost confidence. No charge of any kind is made either to adopters or to parents or guardians. Pending adoption children can be accommodated in the association's hostels at Tower Cressy, Campden Hill, or Castlebar, Sydenham Hill, at a small charge for maintenance. Full particulars can be obtained from the secretary at the address given above. The letter is signed by Lieut.-Colonel Rhys Samson, hon. secretary, and Dr. Robert Hutchison, hon. consulting physician.

THE MECHANISM OF CHYLURIA

EXCEPT as a manifestation of filarial disease chyle rarely appears in the urine, but when it does it attracts immediate attention. At one time it was believed that in certain abnormal conditions of the renal epithelium chyle passed directly from the blood stream into the urine. Now the presence of chyle in the urine is generally regarded as due to fistulous communication between the lymphatic and urinary systems. This communication results from rupture of distended lymph channels caused by an obstruction occurring at some point between the collecting trunks of the small intestine and the

[1] Say 99! Hints for Health and Happiness. By the Laughing Leech. With drawings by Alfred E. Taylor. London: Frederick Muller Ltd. 1934. Pp. 103. 3s. 6d.

mouth of the thoracic duct. The site of the rupture determines whether it is followed by chylous ascites, chylocele, or chyluria. Dr. A. S. Abeshouse has endeavoured [1] to throw some light on the mechanism of the perirenal lymphatics after pyelographic injection. If, he says, a retrograde pyelogram is examined carefully, thin lines will be seen leading from the pelvis towards the spinal column. These are due to the penetration of the perirenal lymphatics by the opaque fluid, the lymphatics most commonly delineated being those which pass from the lower calyx and cross the pelvis to reach the juxta-aortic lymph nodes. This occasionally happens in a normal kidney but more often in cases of chyluria. Dr. Abeshouse says that although it is impossible to be sure of the cause of lymphatic injection in the absence of chyluria, he thinks it is probably the result of an anomalous arrangement of these lymphatics, either congenital or acquired, which allows of the opaque medium entering abnormal communications between the lymphatics and the pelvis and calices. Incidentally he gives an excellent summary of the anatomy of the lymphatics of the kidney.

CAUSATION OF ETHER CONVULSIONS

THE convulsive movements which sometimes occur in persons under ether narcosis remain one of the anæsthetist's unsolved problems. A peculiar thing is that these convulsions were unobserved, and presumably did not occur, until ether had been in common use for a great number of years. It is only since the war that their occurrence has been at all frequent, and they do not seem to be diminishing during a period in which ether is being less used as an anæsthetic. A number of different explanations have been put forward, but none of them applies to all the known instances of convulsions during ether anæsthesia. Dr. E. A. Rovenstine of Madison (Wisconsin), who reports [2] a striking case, suggests that the convulsions may be due to operative manipulation. They have been observed, he says, while active manipulation or stimulation of certain large nerves was being carried out, even in patients who had no tendency towards similar seizures and who were not at the time under anæsthetics. In support of this he recounts his case in detail. A child of 10 was being treated for bilateral congenital dislocation of the hip. The first operation was a long one and convulsions occurred towards the end of it, again during a short operation, and then on several occasions when the child was not under an anæsthetic, but traction was being made on the sciatic nerve. It is not hard to believe that manipulations directly affecting a large nerve trunk may lead to convulsions, but this does not explain many of the occasions on which convulsions have occurred.

INCISIONAL HERNIA

IN an analysis of 300 cases of incisional hernia treated at the Peter Bent Brigham Hospital in Boston, Dr. Charles D. Branch shows that the condition is not uncommon, since it accounted for nearly 10 per cent. of 3142 admissions for hernia during the years 1913-32 (New Eng. Jour. Med., 1934, ccxi., 949). Of the 300 patients 215 were women and 85 men, the greater incidence in women being explained by the greater number of operations carried out through the lower midline incision. Actually some 45 of the incisions in this series were lower midline, and this factor is held to be highly significant. In about 40 per cent. of cases the wound had been drained, usually with subsequent infection, while contamination of a " clean-stitched " wound was reported in 14 per cent. A quarter of the patients were described as obese.

Branch lays stress on post-operative gaseous distension of bowel as an element in the production of hernia. Particular inquiries about this were made in 100 cases, and 43 of the patients were found to have had distension persisting for 24–48 hours or more. At the subsequent repair of the hernia efforts were made to control this tendency; diet was regulated, and cathartics were given in the days immediately preceding operation. Complete success, however, was not attained, for out of 40 recurrences after repair there were 16 in which distension figures as a contributory cause. According to Branch the only individual operation which is especially liable to be followed by incisional hernia is ventrosuspension of the uterus, whether of the fundus or of the cervical stump. Of the 300 hernias 34 were sequels to such an operation, and in 30 of these there was no additional factor, such as infection or obesity. Operations for repair were done in 240 cases and the deaths numbered 4, 2 of them due to strangulation present before operation and 2 to pulmonary causes. Of the 236 who survived 204 were traced, and recurrence was discovered in 40 of them (19 per cent.). In 10 of these, however, it amounted only to a bulging of the wound.

[1] Amer. Jour. Surg., 1934, xxv., 427.
[2] Anæsth. and Analg., January-February, 1935, p. 40.

MECHANICAL MEDICINE

RECENTLY from Texas came a book providing the medical profession with an infallible method of penny-in-the-slot diagnosis. Hard on its heels, and also from Texas, comes news of a penny-in-the-slot laboratory for the layman (Med. Rec., 1934, cxl., 582). For 25 cents a man may void his urine into a machine which will test it before his eyes. The interpretation of the test seems simple. If the urine in the first container turns white, the inquirer knows that his kidneys are not what they should be. If the urine in the second container turns red, he knows he has diabetes. Mechanised diagnosis will presumably lead to mechanised therapeutics, so that a patient may soon be able to dispense with the irksome services of a personal physician, merely passing from machine to machine. It is to be hoped that, when he finally reaches the prognosis machine, it will furnish him with a death certificate which will be a model of accuracy.

THE IMPORTANCE OF DUST

ANYONE who has only envisaged dust as a harmful nuisance will find many other aspects of its importance set out in a book by Mr. S. C. Blacktin.[1] The physical side is fully dealt with; here dust is presented as one of the most ubiquitous and most powerful of agents; it determines rainfall, and, indeed, makes it possible; it is a precedent to life of all kinds; it filters sunlight and determines what portions reach the earth, so giving to the sky its blue colour; it absorbs infra-red and ultra-violet radiations, and, without such scattering, the sun's heat would be unbearable. Dust from volcanoes or of cosmic origin from meteorites may stay in the upper air, forming the staubosphere, carried this way and that for geological periods. Other dust is constantly being manufactured on the earth's surface by mechanical attrition through wind action, and also by the coagulation of particles of smoke systems. Meanwhile dust is being as constantly precipitated from the atmosphere by rainfall. Its constant formation and deposition is analogous to anabolic and katabolic activity. The size of dust particles and the part they play in the electric state of the atmosphere is fully discussed by Mr. Blacktin. Further aspects of dusts depend upon their chemical composition; thus fine particles of such organic matter as coal or flour, or of such metals as iron or aluminium, form explosive mixtures with the air which lead to disasters in mines and factories. Other non-combustible dusts, if mixed with these explosive dusts, can be used to damp them down; in this way the galleries of coal mines are dusted to prevent explosions. Yet other dusts are injurious to living tissues, and after inhalation induce pathological changes in the lungs; the most notorious of these is silica dust, which is definitely toxic and will cause tissue necrosis or, in milder

[1] Dust. By S. C. Blacktin. London: Chapman and Hall, Ltd. 1934. Pp. 296. 18s.

doses, fibrosis or pulmonary silicosis. The last chapter of the book is devoted to these medical aspects of inhaled dusts which may be injurious by reason of their chemical composition or by acting as carriers of microbic infections.

NEW PREPARATIONS

GLUCOSE ALKAGEN GRANULES, a preparation recently placed on the market by Messrs. Allen and Hanburys Ltd., contain magnesium hydroxide, together with glucose and oil of peppermint. The therapeutic directions of an antacid having a double action are obvious, and in gastric hyperacidity the preparation should be found both useful and pleasant.

CALCYDIC GRANULES.—These chocolate-flavoured granules are manufactured by the same firm. They contain calcium, phosphorus, vitamin D, and glucose. Each drachm contains dicalcium phosphate grs. 7½, vitamin D 1500 International units, equivalent to 2½ drachms of good cod-liver oil, and pure glucose grs. 30. Their use under medical supervision is indicated in circumstances of calcium deficiency in children and adults. The calcium is present in an easily assimilable, palatable, and non-irritant form, in intelligent conjunction with the other ingredients.

THE SIZE OF THE HALIBUT

To the Editor of THE LANCET

SIR,—Having recently purchased some halibut from a fishmonger who chatted about fish I was rather astonished at the size this fish can attain. He made the statement that he had heard of one weighing half a ton, but could give no further particulars. My reference books state up to 300, 400, or even 500 lb. in some parts of the world, but not 1120 lb. Could any of your readers state the greatest weight and incidentally what is the proportionate weight of the liver?

I am, Sir, yours faithfully,

London, March 14th. FLÉTAN.

A MEDICAL STOPWATCH.—WE have received from Messrs. Arnold and Co., 122, St. John-street, Clerkenwell, E.C., a model of a chronograph stopwatch adapted for medical purposes by the provision of a pulse-rate dial. The watch has been made with a special eye to suitability for the medical profession and is guaranteed to keep good time independent of the stop mechanism.

Vacancies

For further information refer to the advertisement columns

Aberdeen City, District Mental Hospital, Newmachar.—Jun. Asst. M.O. £300.

Ashton-under-Lyne District Infirmary.—H.S. At rate of £150.

Bath and Wessex Children's Orthopædic Hospital, Combe Park. H.S. At rate of £120.

Belfast Royal Maternity Hospital.—Res. H.S. £26.

Belgrave Hospital for Children, Clapham-road, S.W.—Two H.P.'s and H.S. Each at rate of £100.

Birmingham, Little Bromwich Hospital for Infectious Diseases.—Jun. Asst. M.O. £300.

Birmingham, Selly Oak Hospital.—Jun. M.O. At rate of £200.

Brighton, New Sussex Hospital for Women.—H.S. £150.

Brighton, Royal Sussex County Hospital.—Hon. Clin. Asst. to Early Nervous Disorders Dept.

Cambridge, Addenbrooke's Hospital.—Res. Anæsthetist and Emergency O. Also H.S. Each at rate of £130.

Cardiff, Welsh National School of Medicine.—Asst. Lecturer. £500. Also Demonstrator. £200.

Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall.—H.P. At rate of £150.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Physician to Out-patients.

Connaught Hospital, Walthamstow, E.—Cas. O. At rate of £100.

Croydon C.B.—Asst. M.O.H. and Asst. School M.O. £500.

Croydon, Mayday Hospital.—Jun. Res. Asst. M.O. £300.

Dewsbury and District General Infirmary.—Sen. H.S. £200.

Doncaster Royal Infirmary.—H.S. to Ear, Nose, and Throat and Eye Depts. £175.

Dudley Guest Hospital.—H.S. £170–£200.

Ealing, King Edward Memorial Hospital.—Jun. Res. M.O. At rate of £150.

East Ham Memorial Hospital, Shrewsbury-road, E.—Anæsthetist. 1 gn. per session.

Edenbridge District Hospital, Kent.—Cons. Dermatologist.

Evelina Hospital for Sick Children, Southwark, S.E.—H.S. At rate of £120.

Grove Hospital, Tooting Graveney, S.W.—Res. Med. Supt. £1000.

Halifax Corporation's Isolation Hospital.—Res. M.O. £350.

Harrogate, Royal Bath Hospital.—Res. M.O. At rate of £156.

Hertford County Hospital.—H.P. £150.

Home Office, Children's Branch.—Asst. Med. Inspector. £515.

Hospital for Consumption, &c., Brompton, S.W.—Res. M.O. £350. Two Med. Regs., Res. Surg. O., Assist. Res. M.O. Each at rate of £150. Three H.P.'s. Also H.P. for Frimley Sanatorium. Each £50.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. and H.P. At rate of £150 and £100 respectively. Also Hon. Asst. Physician.

Hospital for Sick Children, Great Ormond-street, W.C.—Res. Aural Reg. £150. Also Sebag-Montefiore Research Fellowship. £500.

Hospital for Women, Soho-square, W.—Anæsthetist.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.S. At rate of £75.

Hull Corporation.—Asst. M.O.H. £600.

Ilford, King George Hospital.—Cas. O. At rate of £150.

Indian Medical Service.—Commissions.

Inverness-shire C.C.—Local M.O. for Parish of Duirinish, Skye. £195.

Lancaster Royal Infirmary.—Sen. H.S. At rate of £175.

Leicester Royal Infirmary.—Jun. Res. Anæsthetist. £125.

Lincoln, Bracebridge Mental Hospital.—Jun. Asst. M.O. £350.

Liverpool and District Hospital for Diseases of the Heart.—H.P. At rate of £100.

Liverpool City Bacteriologist's Dept.,—Two Temporary Jun. Asst. Bacteriologists. Each at rate of £400.

Liverpool, Fazakerley Sanatorium.—Res. Asst. M.O. £200.

L.C.C.—Sen. Asst. M.O.'s and Asst. M.O. for Special Hospitals. £500 and £350 respectively. Asst. M.O.'s (Grade I. and II.) for General Hospitals. £350 and £250 respectively. H.P.'s and H.S.'s. Each £120.

London Hospital, E.—Paterson Research Scholar in Cardiac Dept. £400.

London Lock Hospital, Dean-street, W.—Res. M.O. At rate of £175.

London Lock Hospital and Home, 283, Harrow-road, W.—Anæsthetist.

London University.—Sir Henry Royce Research Fellowship. £500.

Manchester City.—Jun. Asst. M.O.'s for Special Hospitals. Each at rate of £200.

Manchester, Northern Hospital.—Res. Surg. O. £150.

Manchester Royal Children's Hospital, Pendlebury.—Res. Surg. O. At rate of £125.

Middlesbrough, North Riding Infirmary.—Cas. O. At rate of £150.

Mildmay Mission Hospital, Austin-street, E.—Sen. and Jun. Res. M.O.'s. At rate of £140 and £100 respectively.

Newport, I.W., County Mental Hospital.—Res. Clin. Asst. 30 gns.

Northwood, Mount Vernon Hospital.—Asst. Radiologist. Also H.S. At rate of £150.

Norwich, Norfolk and Norwich Hospital.—H.S. £120.

Nottingham General Hospital.—H.P. At rate of £150.

Paddington Green Children's Hospital, W.—H.P. and H.S. Each at rate of £150.

Princess Beatrice Hospital, Richmond-road, Earl's Court, S.W.—H.S. and Cas. O. Each at rate of £110.

Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.—H. P.. At rate of £100.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Asst. Res. M.O. At rate of £80.

Reading, Royal Berkshire Hospital.—Res. M.O. to Blagrave Branch Hospital and Asst. to Pathologist. At rate of £125.

Royal Army Medical Corps.—Commissions.

Royal Northern Hospital, Holloway-road, N.—Radiologist. Also Asst. Radiologist. £580 and £410 respectively.

St. Albans, Hill End Hospital for Mental and Nervous Disorders.—H.P. At rate of £165.

St. Bartholomew's Hospital, E.C.—Research Officer in Deep X Ray Therapy Dept. £500.

St. Mary's Hospital, W.—Asst. M.O. for X Ray Dept.

St. Paul's Hospital, Endell-street, W.C.—H.S. At rate of £150.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.

Sheffield Royal Infirmary.—Res. M.O. At rate of £80.

Sheffield University.—Chair of Anatomy. £1000.

Shrewsbury, Royal Salop Infirmary.—Res. H.P. At rate of £160. Also Res. H.P. At rate of £160.

Southampton County Borough.—Asst. M.O.H. £500.

South Middlesex and Richmond Joint Hospital Board.—Med. Supt. £750.

Sunderland Royal Infirmary.—Asst. Pathologist. £400. Also H.S. £120.

Sutton and Cheam Hospital, Sutton, Surrey.—Sen. Res. M.O. At rate of £150.

Swansea General and Eye Hospital.—Cas. O. At rate of £150–£175.

Swansea, Infectious Diseases Hospital.—Res. M.O. £350.

Taunton and Somerset Hospital.—Two Res. M.O.'s. At rate of £150 and £100 respectively.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Cas. Sorting O. At rate of £200.

Walsall General Hospital.—H.P. and Res. Asst. Pathologist. Also H.S. Each at rate of £150.

West End Hospital for Nervous Diseases, Gloucester-gate, N.W.—Res. H.P. At rate of £100.

Western Ophthalmic Hospital, Marylebone Road, N.W.—Sen. and Jun. Res. H.S.'s. £150 and £100 respectively.

West Riding of Yorkshire.—Sen. Administrative Asst. to County M.O. £1000.

Willesden General Hospital, Harlesden-road, N.W.—Hon. Anæsthetist. Also Hon. Physio-therapeutist.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Youlgreave, Derbyshire; Kidderminster, Worcestershire; and Abergavenny, Monmouthshire.